

**AMERICAN BUILDER
and
BUILDING AGE**

IS THE BUSINESS
JOURNAL OF THE
ACTIVE MEN OF THE
BUILDING INDUSTRY

SUBSCRIPTION RATES—One year, United States, Canada, Mexico and U. S. Possessions, \$2.00; six months, \$1.00; single copy, 35 cents. Foreign countries, \$4.00. ADVERTISING RATES—Furnished on application. Advertising forms close on the 10th of the month preceding date of publication. Entire contents copyright, 1931, by American Builder Publishing Corporation.

MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
AND OF THE ASSOCIATED BUSINESS PAPERS

AMERICAN BUILDER AND BUILDING AGE, with which are incorporated Building Developer, Home Building, National Builder, Permanent Builder, and The Builder's Journal, is published on the first day of each month by the American Builder Publishing Corporation.

President, EDWARD A. SIMMONS; Vice-Presidents, Henry Lee and Samuel O. Dunn; Secretary, Elmer T. Howson; Treasurer, John T. DeMott.

AMERICAN BUILDER

and

BUILDING AGE

(A Simmons-Boardman Publication)

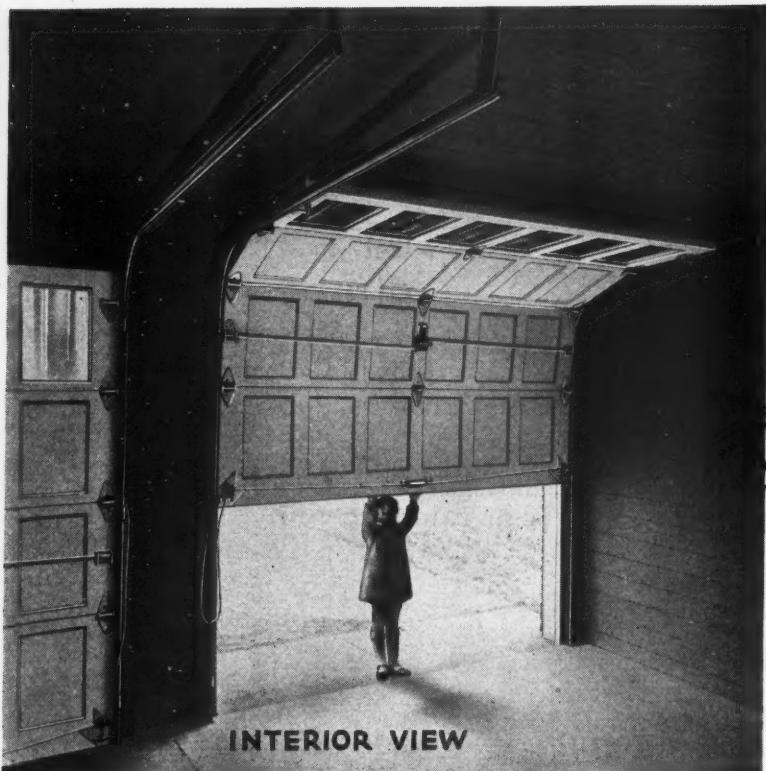
53rd Year

Vol. 51—No. 5

AUGUST, 1931

	Vol. 51—No. 5
Front Cover.....	Oil Painting by L. E. Arent 1
Looking Ahead with the Editors.....	September Forecast 7
Subject Sign-Post.....	Editorial Contents Classified 29
Editorials.....	Must Building Wages Come Down? Wanted: Accurate, Quick Estimates. 31, 32
Frontispiece—Gateways to Satisfaction.....	33
The Production of Low Cost Housing.....	Twelve Ways to Cut Your Production Costs. 34-37
Build and Pay Like Rent.....	Competition Requires Contractors and Building Material Companies to Arrange Home Building Financing Systems. 38
Home Design Department.....	Eleven Designs in Good Taste and Economical to Build, Popular in Size. 39-47
How to Make an Accurate Preliminary Estimate.....	An Easy System of Cost Records from Which Quick Estimates Can Be Made. 48-50
A Page of Gate Details.....	51
The Store Front Apartment.....	Illustrating the Cedar Street Apartments, Bronxville, N. Y. 52, 53
Four Apartments Well Designed.....	Design of Residence Type Containing Four Three-Room Units. 54
The House of the Month.....	Working Drawings to One-Eighth Inch Scale of Charming Little English Design by R. C. Hunter, Architect. 55-59
The Time Element in Construction.....	Why Changes Are Often Necessary Long After Initial Decisions Have Been Made Regarding Quality and Types of Building Products to be Used. 60, 61
Novel Building Method Uses Precast Gypsum Units.....	62-64
Questions of Law Clearly Answered.....	Details of Experiments in Low Cost Fireproof Home Building. 65
Machine Filing Saves Money.....	Contractors Find New Ways to Cut Production Costs. 66, 67
Thousands Are Seeking a Home in the Country.....	Opportunities Beckon Outside the City Limits. 68-70
What Do the Specifications Mean?	Puzzling Points Made Plain. 71, 72
Practical Job Pointers.....	A Readers' Exchange of Tested Ideas and Methods Taken from Their Own Building Experience. 73, 74
Better Buildings—Lower Costs.....	A Selection of the Most Interesting of the Month's New Offerings in Building Materials and Equipment. 75-80
News of the Industry.....	82-86
The Builder's Library.....	88
Advertisers' Index.....	107

BERNARD L. JOHNSON, Editor; Joseph B. Mason, Managing Editor; R. H. Mathewson, Eastern Editor; H. F. Lane, Washington P. W. Hanna, L. E. Arent, Associate Editors; Robert H. Morris, Business Manager.
EDITORIAL AND PUBLICATION OFFICE: 105 W. Adams St., Chicago; Telephone, Randolph 0794. Branch Offices: New York, 30 Church St.; Cleveland, Terminal Tower; Washington, 17th and H Sts., N. W.; San Francisco, 215 Market St.



Mr. Builder:

**Assure Your Customers
the Best -- Specify The
"OVERHEAD DOOR"**

OVERHEAD DOOR
REG. U.S. PAT. OFFICE
is the
Standard of Comparison
in Garage Door
Design, Operation and Construction

The "OVERHEAD DOOR" for the modern garage is manufactured exclusively by Overhead Door Corporation of Hartford City, Indiana. It has been before the public for ten years, and today is the standard of comparison in garage door design, operation and construction. *It is backed by a nation-wide sales and service organization.*

The contractor who specifies The "OVERHEAD DOOR" knows that his responsibility is then at an end—knows that the installation and perfect operation of the door is assured *always* by a force of 5000 service operatives—that a door engineer, whose responsibility it is to see that the door gives complete satisfaction, is in every community.

"OVERHEAD DOORS" are going into thousands of old and new garages and buildings this fall—get in on this profitable replacement business. May we send you our Catalogue No. 16, together with the name and address of the Overhead Door Company in your community?

OVERHEAD DOOR CORPORATION

Dept. 317

HARTFORD CITY, INDIANA - U. S. A.

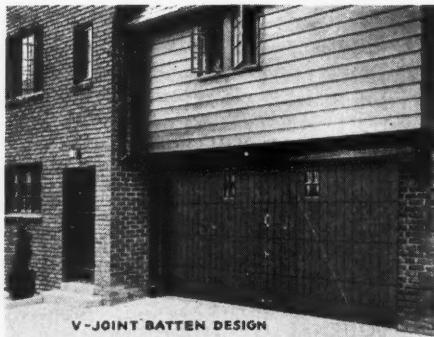
Made in Canada by

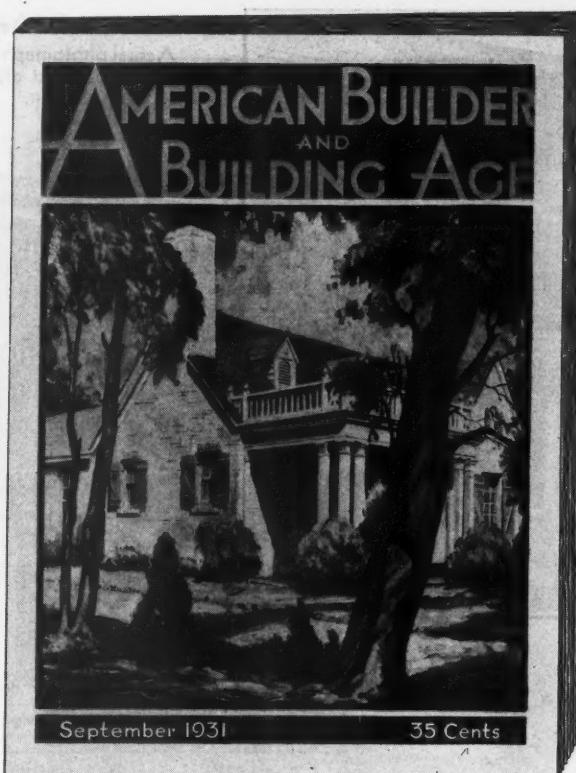
Overhead Door Company of Canada, Ltd., Toronto, Ontario



© O. H. D. Corp. 1931

FOR ADVERTISERS' INDEX SEE NEXT TO LAST PAGE



LOOKING AHEAD
WITH THE EDITORS

September, 1931

Stimulators for Fall Business—

FOR the September magazine, we have several features of special timeliness. How to get more home building started this fall—so as to take advantage of the present low prices and so as to put more men to work and to keep them employed throughout the coming winter—is of course the industry's greatest concern at this time.

From our surveys and investigations, it is evident that conditions are improving and that a substantial volume of building activity is developing. American Builder & Building Age subscribers have always been known as men of enterprise and resourcefulness. They are go-getters. They don't wait for business to come to them. They go out and get it. They *create* business.

So it is that our September

issue will be filled with ideas, plans and suggestions for getting more business—definite tested methods which other builders have tried and found good—ideas for modernizing old homes and business buildings and for promoting, planning, financing and building new homes and apartments.

We have a specially selected group of home designs in this issue that you will like and that will help you to interest many prospective home builders, if you will make it a point to place this magazine in their hands.

Perhaps, up to this time, you have made no serious effort or thorough canvass of your community for modernizing contracts. Do so now. You will find many an owner ready to talk over suggested improvements.

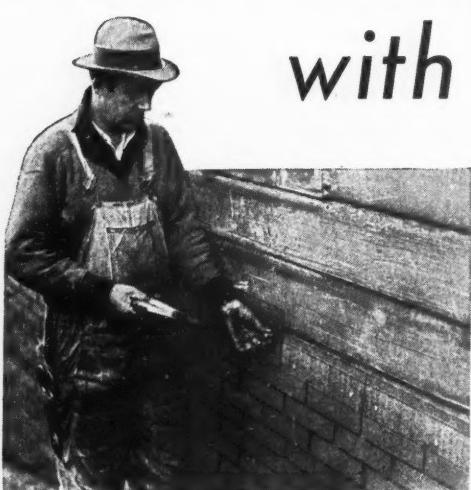
—The Editors.



Before and After . . .

Actual photographs of the same building before and after the application of Carey Siding.

Make Profits NOW with Carey Siding



The Philip Carey Company
Lockland, Cincinnati, Ohio

Please send samples and full information about Carey Siding.

Name.....

Street.....

City..... State.....

Whenever a frame building needs paint or repairs, the owner is a ready prospect for Carey Siding. Made of tough asphalt felt, mineral surfaced in red, buff or blended tapestry, Carey Siding is rust proof, rot proof and never requires painting. When applied, it looks like high grade face brick, and its added protection makes buildings warmer in winter and cooler in summer. Finally, the cost is low—just about the price of a couple of paintings.

We are helping dealers and builders to get the siding business which is waiting in every community. We do all the solicitation necessary to actually create new business from old houses. If the owner wishes special payment terms, the Carey Finance Plan carries the transaction for 6, 12 or 24 months, as desired.

Every dealer or builder who wishes to increase his profits should know all about Carey Siding and the practical Carey plan for securing profitable business. Write, or clip and mail the coupon, and we will send full information.

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio
Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey
PRODUCTS
ESTD. 1875

HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
ASFALTSLATE SHINGLES
BUILDING PAPERS

SUBJECT SIGN-POST

A Quick Guide to the Business Articles and Designs
Presented in This Issue

BUSINESS MANAGEMENT

Editorials	31, 32
Must Building Wages Come Down?.....	31
Production of Low Cost Housing.....	34-37
Build and Pay Like Rent.....	38
Legal Questions Answered.....	65
Machine Saw Filing Saves Money.....	66, 67
Opportunities in Building Country Homes....	68-70

DESIGNS AND PLATES

Homes of Popular Size.....	36, 41, 42, 43, 46, 47, 55
Homes of Larger Size.....	40, 44, 45, 68, 69
House Plans, Complete Set.....	55-59
Alpine Chalet Design.....	61
Details of Construction.....	51, 56, 71, 72
Apartment Designs	52, 53, 54
Income Home Design	54
Country Home Design	68, 69
Farm Home Out Buildings.....	69
Interior Detail Photographs.....	41, 70
Exterior Detail Photographs.....	33, 36, 37, 39, 45

MERCHANDISING AND ADVERTISING

Survey Shows Proper Price Range for Those Building Homes to Sell.....	34, 35
--	--------

Quick Estimates and Selling.....	48-50
The Time Element in Construction.....	60, 61
New Devices with Sales Appeal.....	75-80

TECHNICAL AND CRAFT PROBLEMS

Twelve Ways to Cut Construction Costs.....	90
How to Make Accurate Preliminary Estimates.	48-50
Novel Building Methods Utilize Precast Gypsum Units	62-64
What Do the Specifications Mean?.....	71, 72
Practical Job Pointers	73, 74

DEPARTMENTS

Editorials	31, 32
Home Designs	39-47
"The House of the Month," Complete Plans...	55-59
Contractors' Equipment	66, 67
News of the Industry.....	82-86
June Building Figures.....	86
Calendar of Coming Events.....	82
New Materials and Devices.....	75-80
Masthead Page	5
Forecast of September Issue.....	7
Index to Advertisers	107

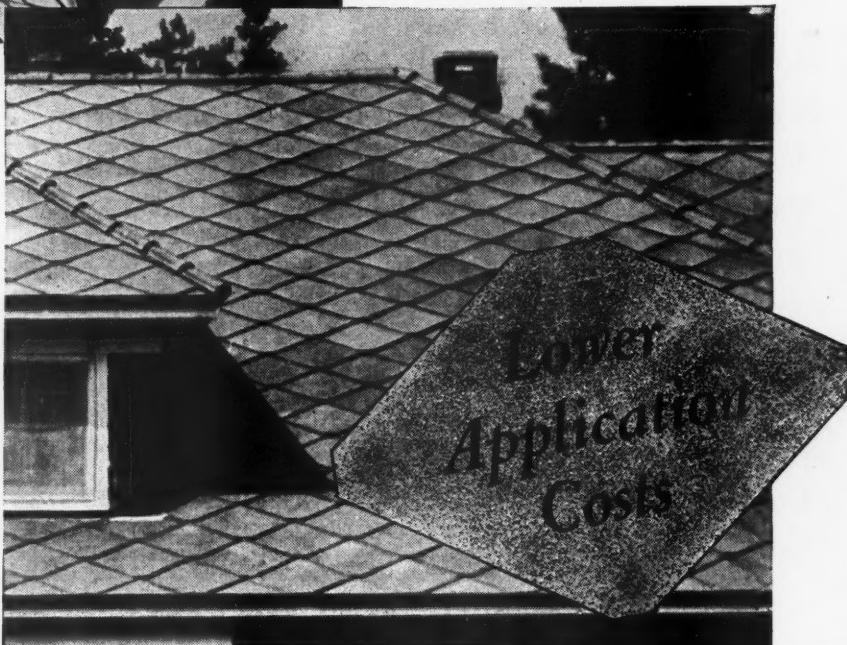
These asbestos shingles lay *as simply* *and as fast as asphalt shingles*



THE J-M DIAMOND THATCH ASBESTOS SHINGLE

HERE is a brand-new shingle style with many special features that will appeal to you. No more chalk lines, no more troubles with storm anchors—and with the J-M Clincher you can lay this attractive roof better and quicker than you have ever laid a roof before.

J-M Building Materials and J-M advertising are creating new interest among home owners and prospective home builders. Apply to your dealer for the latest information, or address Johns-Manville, 292 Madison Ave., New York.



THE NEW J-M CLINCHER

A new device for fastening the lower corner of shingles. As simple as a safety pin—locks with a tap of a hammer—stays locked—speeds up application.



NEW FINANCE PLAN

A new time payment plan for remodeling work financed by Johns-Manville—you get 100% of your money on completion of job—the home owner pays out of income.

Johns-Manville



Building Materials



AMERICAN BUILDER AND BUILDING AGE

MUST BUILDING WAGES COME DOWN?

THE present situation in regard to wages in the construction industry is highly unsatisfactory. In the first place, large and prominent builders who have rigorously maintained union rates are not getting a square deal because they are forced to compete with smaller organizations that are not maintaining the published union scales. It appears that union men are getting the full rate from some contractors while many others are working for lower wages. Non-union men are willing to work for whatever they can get.

Contractors doing Government or public work are being discriminated against through the stipulation, usually a part of the contract, that no labor at reduced wages may be employed. But bargain prices are demanded. Does the government insist that all other products it buys be produced at wages paid during the country's most prosperous era? We think not. We believe that the building industry is the *only* one which is *forced* to pay high wages, and that at the same time government purchases of airplanes, food stuffs, and a thousand and one other products are going ahead without any questions asked as to what the producers pay their employees. Such unusual and uncalled for interference in a matter that is strictly the contractors' business is manifestly unfair.

Under Cover Methods

Many contractors are buying labor at less than pre-depression wages by the simple device of sub-contracting work in small pieces to groups of workmen. By dividing the job into small sub-contracts in this manner, a boss workman with one or two helpers performs a given amount of work on a piece basis instead of at the established hourly rate. The result is lower wages.

Other builders, faced by fierce competition and a demand for lower building costs, are taking various other steps to reduce labor costs. Part time work, "staggered" working days and shorter hours are com-

mon. Contractors who maintain the established rates are saying nothing about it because they feel that if the public knows they are paying higher wages than some of their competitors it will expect the structures they build to cost more. Contractors who *do* lower wages are for the most part not advertising the fact. The net result is confusion, uncertainty, and subterfuge.

"Low-Cost" Advertising Prevented

We are strongly of the opinion that if lower wages are being paid in the construction industry, as widespread reports indicate, it would be better to come out in the open and frankly admit that such is the case. Builders could then go out after business with a vigorous argument of *low costs*. It is doubtful whether in those cities where money wages of building employees have been reduced, *real wages* (income measured by buying power) have actually suffered much, if at all. This is due to the fact that the cost of living has been steadily decreasing. From a high of 216.5 in June, 1920, the index compiled by the Bureau of Labor Statistics on living costs declined to 160.7 at the end of 1930, and has gone down considerably more in the past six months. Thus where money wages have remained constant, real wages have increased materially. The Bureau of Labor Statistics estimates this increase at 13 per cent in the period from 1921 to 1929.

Greater frankness in facing this problem of building wages would be of immense value to all concerned. One point that should be more clearly brought out is the need for more steady employment throughout the year by spreading construction work over twelve months rather than trying to crowd it all into a few months. Critics who point to the hourly wage rates of some of the building trades, saying that they are high in relation to other trades, usually fail to consider the point that these men are able to work only a part of the time. Profits of contractors and wages of their employees should be fig-

ured on a year-around basis. Stimulation of winter building would do much to help both employers and employed in this respect, and there is no sound reason why construction should not be put on a twelve month basis.

Strong arguments may be presented on both sides of the debate over wage reductions. It is pointed out that high wage scales are perhaps prohibiting much construction work that would otherwise be undertaken at this time. Although building material prices are 20 per cent less than they were five years ago, published wage scales are 8 per cent higher, and many financial and investment interests declare that total construction costs are still prohibitively high. They declare that, looking at real estate and building from a purely investment basis, the costs are out of line, and since labor, which composes approximately 50 per cent of the construction cost, has made no concession to changed economic conditions, adjustments downward are now in order.

Wage Cuts Opposed

These people also point out that reducing building wages would do much to increase employment in the industry. As stated by United Business Service, "With reduced labor rates, more construction projects will be planned, more men will be at work, and the aggregate payroll will equal or perhaps exceed that of the present."

On the other hand, any reductions are strongly opposed by the present administration and by many industrial leaders. James A. Farrell, president of the United States Steel Corporation, for example, says: "Instead of tending to increase consumption of our industrial and agricultural products, wage reductions must inevitably reduce the purchasing power of wage earners and restrict consumption. It is my deliberate judgment that a general reduction of wages in this country, instead of relieving the situation, would set back the impending recovery by at least two years."

Labor as Well as Capital to Make Sacrifices

While such arguments as this cannot be ignored, many contractors are finding it hard, in the face of disheartening conditions, to take such a large national view. They are inclined to argue that in view of the fact that their profits (or in other words, their wages) have been drastically reduced or eliminated altogether, it is not asking too much that the men they employ should also accept a reduction in income. They argue that when they were making money they paid their men high wages; now that they are *not* making money, and possibly are operating at a loss, they expect their men to accommodate themselves to the unfortunate but avoidable results of depression. Labor as well as capital must expect to make sacrifices at this time.

It should not be forgotten, however, that the efficiency

and productivity of labor has undoubtedly increased in the past decade. Men who produce more, it can be argued, are worth more; hence any advance in real wages is easily justified. The exact increase in labor efficiency is hard to determine as it is so intermingled with improved machine and management methods.

Frank Consideration Needed

It is our opinion that the wage policy of contractors is one that should be handled openly and frankly and that it cannot be regarded as a fixed, unchangeable matter, or one that can be governed by a national policy or inflexible rule. Varying conditions call for different solutions. Certain it is that the present attitude of American business and of the public as a whole towards buying new construction, demands not only rock bottom building costs but an aggressive selling campaign to advertise them. Construction costs are being reduced by low material prices, increased labor efficiency, reduced overhead, and greater efficiency through use of modern equipment. Whether wage adjustments shall be the next step is a matter for the individual builder to decide candidly and openly with as little hardship as is humanly possible for the men who look to him for the support of themselves and their families.

WANTED:

ACCURATE QUICK ESTIMATES

NO ESTIMATE AT ALL IS BETTER THAN AN INACCURATE ONE would be a good slogan for some men to frame and hang on their office wall. Nothing destroys the public's confidence in the work of builders, or of architects, as the practice of making preliminary estimates that later on turn out to be far from the actual cost of the structure. The customer feels that he has been tricked into starting on a project that cost more than he wanted to spend. Quite rightly he feels indignant and perhaps disgusted with the whole building fraternity.

But does this mean that quick preliminary estimates must be refused? Rather let us say, they are to be discouraged, and avoided wherever possible.

There are times when quick estimates are necessary, and to prepare for these times, cost data conveniently recorded and thoroughly digested should be developed. In the article on this subject in this issue, "experience tables" such as have proved so successful in the life insurance companies are recommended. Whatever form is adopted, there is no doubt whatever but that the only basis for quick estimates is accurate cost data put down in a systematic manner and interpreted in the light of long experience and good judgment. This is one place where "hunches" are dangerous unless backed up by facts.



Photo by John Wallace Gillies

Gates to Contentment

The urge to home owning lies deeper than economics and the saving of rent money. In becoming a home owner one can feel that he is making an investment that is sound financially and, what is more important, one that will yield big dividends in peace, security and contentment for the entire family.

THE PRODUCTION OF

Twelve Ways to Cut Your

SOME day a revolutionary method of construction may obtain a strong foothold in the residential building field but, meanwhile, the individual builder is faced with the problem of reducing costs on his own operations so that he may build dwellings profitably and in the right price range. How can he cut costs? Several ways are open to him. Successful builders use a combination of cost-cutting methods. In this final article of the series on the production of low cost housing, we discuss twelve methods of reducing costs and give examples of successful operations in which builders have succeeded in bringing down costs of production to levels where they have been able to make good sales.

T has been said that builders do not know their own business. What is really meant is that some builders do not know their own business. And they do not know it because they do not keep adequate records of costs. "To know costs is to be able to cut them," is pretty true of the building business; at least, it would probably apply to seven out of ten operations in the residential field.

A housing engineer in a large Eastern city recently gave an account of an interview with a builder who had asked his advice. The builder had an operation of 36 houses in mind. "What is your figure per house?" asked the engineer. The builder gave it. "That is much

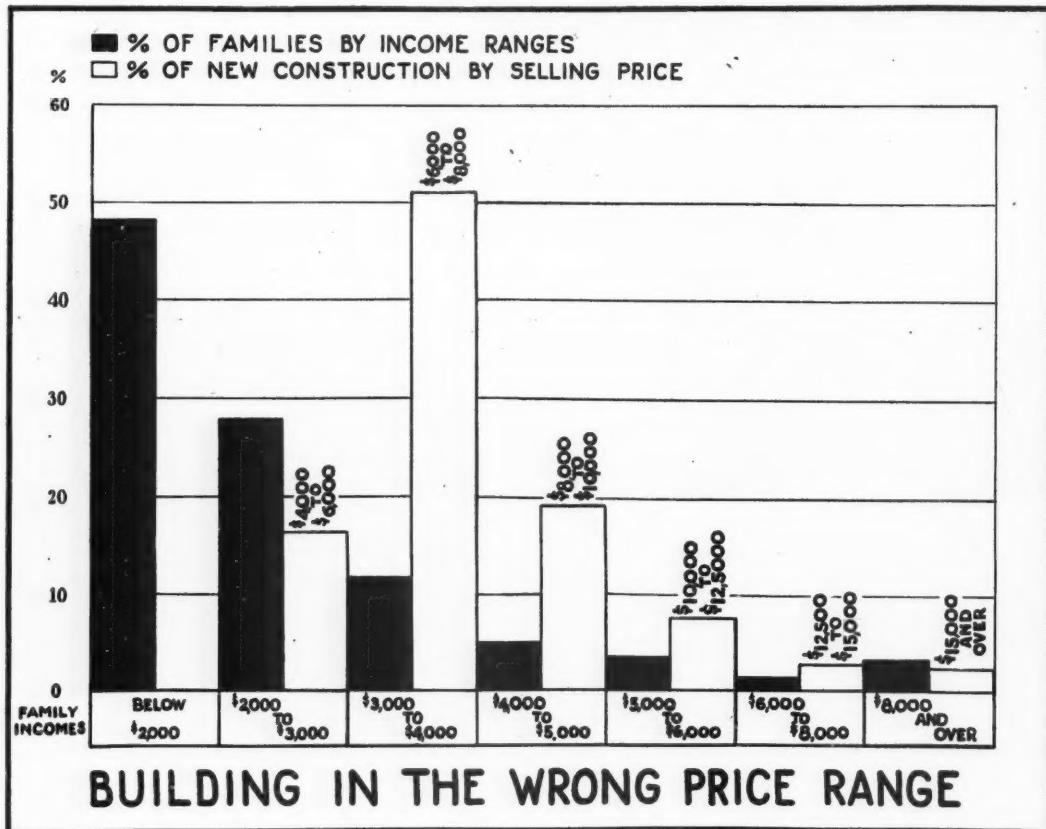
too high," replied the expert. Somewhat angrily, the builder replied that he had gone over the estimate time after time and he saw no possible way of cutting the figure down. "How would you bring the cost down," he inquired.

"Well," said the engineer, "let me ask you this question: Do you use the same men to lay brick on the back wall as you do on the front?" "Why, yes," replied the builder. "Cut it out then," advised the expert. "Keep your best men on the facade and train them down so that they can make faster time on the whole operation. Use cheaper men on the rougher brickwork. You'll find it pays."

Further analysis showed that the builder was still carrying brick up a ladder in a hod and that his operations were filled with bad practices that wasted time and money. His operation was refigured on the basis of efficient planning, and he was shown, that on a project of this kind, a saving of time was a saving of money. The story goes that he undertook the job on this basis, finished in good time, turned over his houses and made a substantial profit at a much lower selling price than he would have originally thought possible.

Residential building construction is really a complex operation that requires keen analysis and the exercise of sound judgment all along the line. Some builders make a mistake right in the beginning by trying to establish a business in the wrong price range.

Glance at the chart shown here. It reveals conditions in one of our largest cities, where dwelling houses have



The great potential market for low cost housing is revealed by this chart of the building situation in Philadelphia, compiled by the Philadelphia Housing Association. Too many houses have been built in the \$6,000 to \$8,000 range, too few in the \$4,000 to \$6,000 range. If we are to learn to produce salable housing we must make investigations of this kind to discover in what price ranges we should build.

LOW COST HOUSING

Construction Costs

CONSTRUCTION DEPARTMENT						
BUILDING ESTIMATE						
ITEM	QUANTITY	UNIT	UNIT PRICE	LABOR	MATERIAL	TOTAL
122 BRICKWORK						
Common brick, field walls						
" " Veneer	3	360.00				
" " Chimney						
" " Purch. stone						
" " Purch. stone	34.125	1.00				
" " Steps						
Façade brick, Exterior						
" " Interior						
" " Flashing and bracing						
Fire brick						
Black water wall						
Flue tile						
Tile courses						
Dimensional blocks	3,180					
Cutting and notching						
Reinforcing steel and rods						
123 Concrete work						
Concrete formings						
Foundation walls, concrete						
Foundation walls, Blocks 4"	18	81				
" " " 6"	184	1				
" " " 8"	91	1				
" " " 10"	878	1				
" " " 12"	876	1				
Concrete floors on ground (Cubes & forms)	876.37					
Self-supporting concrete floors	180					
Concrete steps						
Concrete step forms						
Rough backs						
Under Slab						
Concrete ceilings, ston. supports						
Goal Chute						
Parging						
TOTAL CONCRETE WORK						
122 BRICKWORK						
100 EXCAVATING	1.00	GT	.70			
102 Collars, earth						
103 Collar rock			1,000.00			
104 Backfill						
105 Paving						
106 Shoring and shoring						
TOTAL EXCAVATING	1.00					
122 CONCRETE & BRICKWORK						
122 Concrete work						
Hand excavation, back						
Concrete formings						
Foundation walls, concrete						
Foundation walls, Blocks 4"	18	81				
" " " 6"	184	1				
" " " 8"	91	1				
" " " 10"	878	1				
" " " 12"	876	1				
Concrete floors on ground (Cubes & forms)	876.37					
Self-supporting concrete floors	180					
Concrete steps						
Concrete step forms						
Rough backs						
Under Slab						
Concrete ceilings, ston. supports						
Goal Chute						
Parging						
TOTAL CONCRETE WORK						
122 CONCRETE & BRICKWORK						
100 EXCAVATING	1.00					
120 C CONCRETE WORK						
130 B BRICKWORK						
140 ELECTRIC WIRING						
150 P PLUMBING						
150 H HEATING						
160 BIRDFORK						
180 ROUGH CARPENTRY-LABOR						
190 ROUGH CARPENTRY-MATERIAL						
200 MILL WORK-LABOR						
210 MILL WORK-MATERIAL						
220 ROOFING AND SHEET METAL						
230 LATHING AND PLASTERING						
240 STAIRWORK						
260 FINISHED WOOD FLOORS						
270 TILE AND MARBLE						
280 GLASS AND GLAZING						
290 PAINTING AND DECORATING						
300 EQUIPMENT						
310 UTILITY CONNECTIONS						
CONTINGENT						
FIELD SUPERVISION						
TOTAL						
Building Contract: 22500		Cubic Yards	Per Cubic Yard [Cents]	36.5		
Prepared by _____						
Checked by _____						
Department Head O. K.						
Date _____						

CAREFUL estimating, on the basis of known costs, is absolutely essential to the cutting of construction costs. Here is how one large firm of residential builders makes estimates. Sheet No. 1 shows the major operations and their estimated totals. On the following pages, each major operation is broken down into its sub-operations and these are figured separately. When costs are actually incurred, they are entered against the account numbers of the various operations and then are recorded on forms similar to these estimating forms. Thus, a perfect comparison is afforded between the estimates and the actual cost.

been mistakenly erected in many price ranges where people could not afford to buy them on the basis of their incomes. Note especially the tall white column showing more than 50 per cent of construction in a price range of from \$6,000 to \$8,000. Only families with incomes ranging from \$3,000 to \$4,000 could afford these homes and these families accounted for only 10 per cent of the prospects, as shown by the low black column alongside. Study this chart more closely after you have finished this article, it discloses, as nothing else could, the futility of building in the wrong price range.

What is the right price range? The chart gives an indication of what this might be for one single city; but in another locality it may have no application. For any particular community, the right price range might be gauged by estimating incomes, living standards, range of prices in other commodities, land values, etc. In any case, it will probably be found that a big market has been overlooked in the lower price ranges and that it is in these that the builder may find his success.

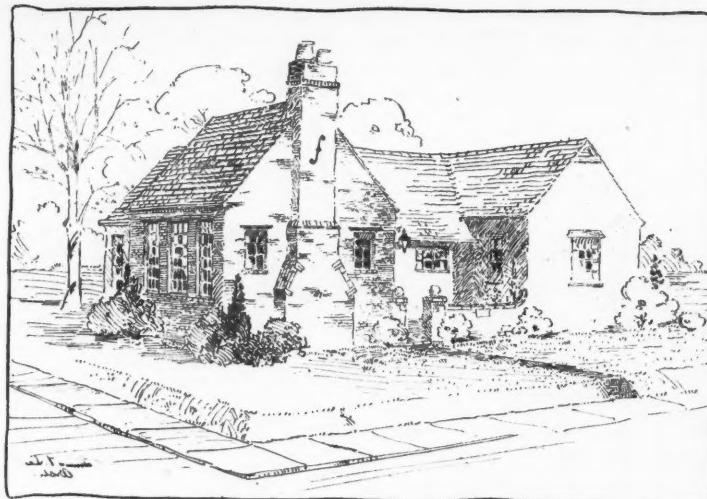
Some time ago, the National Association of Real

Estate Boards published a table showing the number and per cent of sales in various price ranges. This table was based on reports of sales from 100 firms in 76 cities:

Price Range	Number of Sales	Percentage of Sales
\$6,000 to 6,900 incl.	1,041	10.29
4,000 to 4,900 incl.	1,008	9.97
5,000 to 5,900 incl.	988	9.77
7,000 to 7,900 incl.	845	8.35
2,900 or less	826	8.17
3,000 to 3,900 incl.	791	7.82
8,000 to 8,900 incl.	596	5.89
10,000 to 10,900 incl.	534	5.28
13,000 to 14,900 incl.	532	5.25
15,000 to 16,900 incl.	449	4.44
20,000 to 24,900 incl.	396	3.96
17,000 to 19,900 incl.	392	3.87
9,000 to 9,900 incl.	387	3.81
35,000 and over	366	3.62
12,000 to 12,900 incl.	304	3.
25,000 to 29,900 incl.	263	2.6
11,000 to 11,900 incl.	230	2.27
30,000 to 34,900 incl.	166	1.64



The frame house, single or two-family, still offers one of the best opportunities to provide attractive housing at low cost. Above are shown a group of homes at Radburn, New Jersey, where ground has been scientifically subdivided to provide park and garden space and where children do not have to cross streets to go to school.



This would indicate that a price ranging from \$6,000 to \$6,900 for the home, land and building, is proving to be most popular now. And the preference will probably continue to go lower, rather than higher. In this table, the largest incidence of sales, 30.4% of all sales, is in the price range of \$4,000 to \$6,900 inclusive. It is significant, that sales in the groups under \$8,000 in price, comprise well over half of all the sales reported.

Many successful builders, particularly in the speculative group, have carefully analyzed their market and have definitely chosen a certain price range as offering the greatest possibilities. Having first selected this price range, they then proceed to design a house with the greatest appeal and the lowest cost within that price range, and so plan their operations so as to cut costs to the bone.

One of these builders recently took a visitor through the street where his houses were going up on both sides. All the way down the road, houses were in different stages of construction, and the crews were following each other along, each doing a specialized task and being imme-

dately followed by the gang behind. There were no gaps in the schedule, when one crew had finished its operation, another was ready to come in.

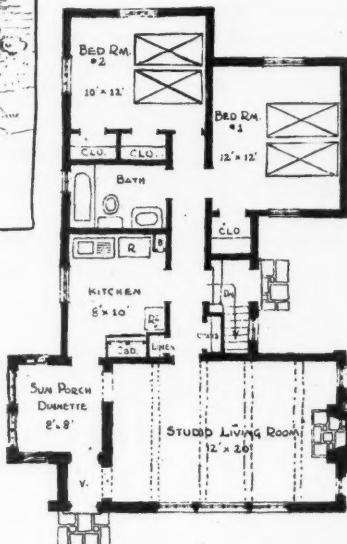
The operation had been completely analyzed so that bricklayers, carpenters, plumbers, electricians, lathers, plasterers, finishers—all followed a rigid time schedule.

Said the builder: "There is no waste on any of my jobs. You will find no stuff lying around in the street waiting to be used or left over from a previous operation. Lumber and other material comes in when needed and only in the amount needed, we do not order shipments in big lots, although the total quantity used on the operation may bulk large.

"I get my stuff at a good price because of quantity purchase but it is bought and paid for only as needed.

"We effect a great saving in the way we handle our labor. The subcontractor is given a fixed fee for the job and he must see that his men

operate in such a way that he makes a profit. We do not have a high overhead for superintendence, nor for advertising and selling expense. The land was purchased at a low figure, and our homes are sold so rapidly that we do not



This new type of steel frame bungalow measures 49' x 28', contains 8400 cubic feet and is said to be designed so as to require much less steel than the ordinary steel frame structure. Its sponsors propose to erect this attractive brick cottage to sell for \$5700, not including the land. It is planned to erect this bungalow together with a story-and-a-half house of similar construction in an Eastern community this summer. Plan shown to right.



have excessive carrying charges. We watch the situation very closely and as soon as sales begin to fall off, we cut down immediately on construction."

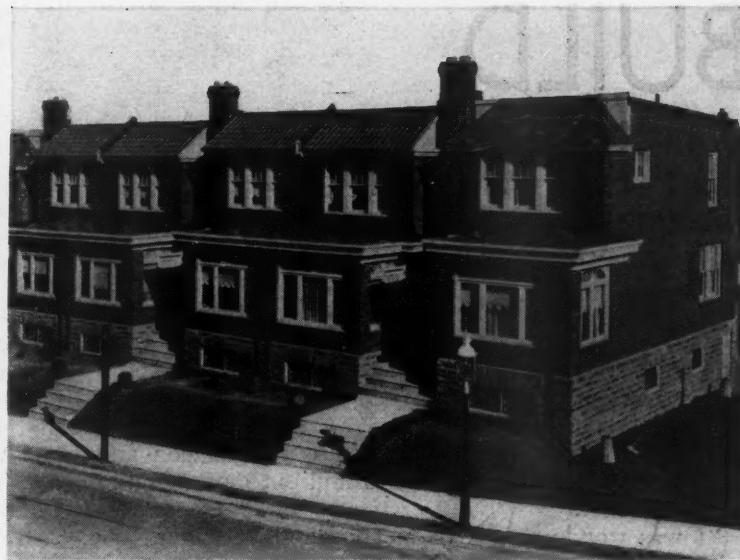
At the end of the street was a large shed. "That is where we make our own concrete blocks," explained the builder. Halfway down the street, bricklayers were putting the finishing touches on the facade and carpenters were carrying readybuilt staircases inside and putting them in place.

On another street, a steam shovel was digging a continuous trench in the sand where, soon, another foundation was to be poured for another row of houses.

Some time later, a competitor of this builder remarked: "Jones is smart. You have to hand it to him. He has a bathroom in each one of those houses so luxurious that prospects can't resist it. Some wonder how he does it. That classy looking tile job, for example. Do you know how he got that expensive looking tile in there? Well, he nosed around the city until he found a quantity of odd lots of fine tile, bought the whole of it up, sorted it out, made various color combinations and installed it on the job at a cost that no other builder can duplicate."

Just one example of alertness and shrewd buying that explains Jones' success. And it is an example that almost any builder, whether he builds one house or fifty, can follow. Even on a small house, costs can be cut by watching and looking for buying opportunities, utilizing materials that others would overlook.

But not all builders take the trouble to analyze their operations and their costs. Even among big residential builders, there are those who do not really know what their costs are. Many a builder has



In Philadelphia they have succeeded in producing homes to sell for around \$5,000 and even lower. Row construction, efficient labor handling, close buying, lower financing costs enable them to erect dwellings like the above at a price of \$5,350.



Below are shown typical row houses of solid brick, selling for \$7,200. Trench excavations, speedy construction, bulk buying, reduced labor costs, luxurious interiors, facades with popular appeal characterize row houses of this type. In the New York area they are selling faster than ever before.

Fireproof house of special construction with walls of hollow masonry blocks and with outside wall of brick veneer. Steel joists support concrete floors. This type of house illustrates the possibility of reducing costs through the application of new materials.

boasted of producing a dwelling at low cost and has been accused by a competitor of not knowing his costs. Probably this accusation is justified in a good many instances. In others it is not. One builder of fine residences in the East has had a cost card made

up on which records are accurately kept of time on the job.

One of the best and most accurate systems in use today is that which employs a complete building estimate against which is checked the actual construction costs when they are incurred. The building estimate is made up on specially printed sheets, on ruled paper, punched on the sides so that it can be bound into a ledger.

Number 1 sheet of this estimate is illustrated on the first page of this article. It contains a summary of operations together with account numbers for each operation. A total estimated cost is shown and this is also expressed in terms of cubic foot cost. The following sheets, about nine in number, show the various operations broken down into sub-operations and sub-costs

(Continued to page 90)



BUILD and Pay Like Rent

By HARRY W. FLANNERY

"**M**Y gracious. John, did you see this house in the *News*? Forty-two dollars and fifty cents a month, it says. Look at it. It's a better house than ours and we're paying fifty dollars a month rent."

"H-m-m," says John. "Tear out that coupon and we'll send it in. It won't hurt to find out more about a thing like that."

"I was wondering if we'd ever get to own our own home. Maybe we can do it now."

Conversation like that could have been overheard in cities all over the country last year, and it is being heard again this year. Is the advertisement that is causing the conversation yours, as a building material dealer, or as a builder, or is it one by the new element in home building, the mail-order house local store?

Advertisements by one or more of the big mail order houses have been the cause of most of these conversations. As a result,

one such out-of-town firm is doing 40 per cent of the home building business in many cities, and was estimated to have done \$100,000,000 worth of building in 1930. According to *Business Week*, for October 22, 1930, the Sears-Roebuck home building campaign was "so successful that, despite the continued and unprecedented lag in residential construction generally, Sears, Roebuck reports that its operations under the new plan have surpassed in number of homes built and volume of materials sold all previous years the company has been supplying ready-cut homes and building materials."

Fundamental in this success is a 15-year loan plan for home builders. Everyone admits that, and yet few building material dealers or build-

HARRY W. FLANNERY
Ft. Wayne Builders' Supply
Company

ers are doing anything about it. Most home builders would prefer to patronize local building industry units, but few have enough cash on hand at one time to build and pay for a home complete, or even to make a large payment. Consequently, the monthly payment basis is the only means by which most persons can build the home about which they have dreamed.



Competition Requires Contractors and Building Material Companies to Arrange Home Building Financing Systems

Also, few persons know or care much about the total cost of a house, or the details of financing it. They cannot understand how the principal and interest are reduced, nor do they care much about that. Home building financing is to them like the comparative cost figures on life insurance. They are interested only in building as good a home as possible at the monthly cost they can afford to pay.

Building material dealers and contractors must therefore make arrangements for a system of financing to extend to prospects. They must do this for their own salvation, for otherwise, Sears, Roebuck; Montgomery, Ward; and Hartman's will step in and take their place. This will be despite the fact that local building industry prices on the same house are less, and that it would be to the advantage of home seekers to deal with local interests for many other reasons, too. There are, for instance, in regard to dealing with a local building material dealer, the advantages of dealing with a concern that knows local real estate, contractors, and architects; that can select the best contractors in the city to do the building, rather than the class of men that now take mail-order local store work; that can offer the advantages of protecting materials in storage, rather than delivering them in bulk subject to the deteriorating effects of the weather.

Building material dealers and contractors can co-operate in offering a financing proposition to home building prospects, as has been done in many cities, or they may offer such a plan as individuals. At any rate, it is imperative that dealers and contractors offer such a plan. Unless they do so, their day is done.

But how can this financing arrangement be made?

No definite answer can be made to this question, since the means varies with locality. Perhaps you can work with a building and loan concern in your territory, with local banks, or with a life insurance company.

Insurance Company Funds

The Prudential Insurance Company advertises in a folder distributed in Fort Wayne, Ind., and elsewhere:

"The Prudential Insurance Company of America loans on improved and desirably located modern dwellings, apartments and business properties in approved localities, secured by mortgages on which principal and interest are payable in monthly installments."

"Interest is charged at the rate of 6 per cent per annum and credit is given to the borrower each month for installment paid on account of principal, interest being reduced each month accordingly."

"Payments on account of principal are so arranged that $\frac{1}{2}$ of 1 per cent of the principal is paid each month. The terms of the mortgage will permit borrower to pay more than the monthly installment of principal, as the company agrees to accept additional payments on any interest payment day, such additional payments, however, to be in multiples of the monthly installment payment."

"Installment loans may be written for any even number of years from five years to 16 years and 8 months."

(Continued on page 102)



Homes to be Proud of

Eleven Designs in Good
Taste and Economical to
Build — Popular in Size.



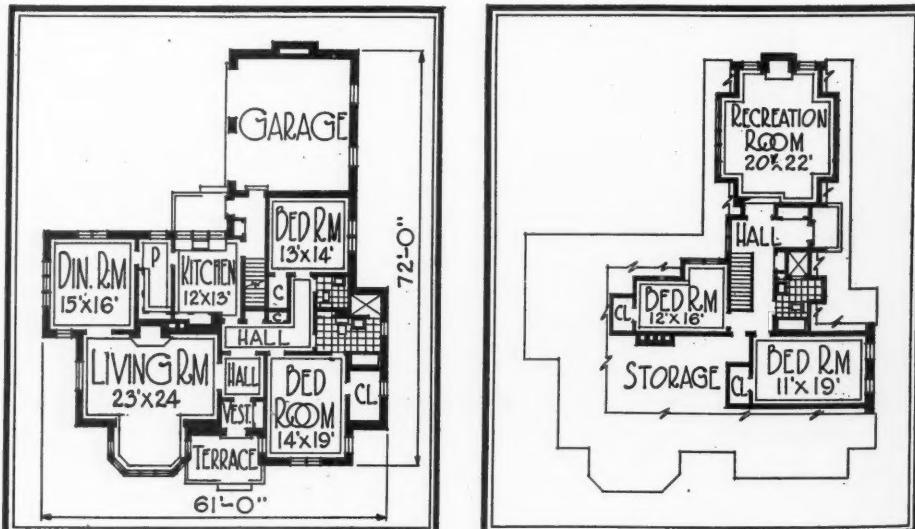
DAHLMAN CONSTRUCTION CO., Builders, Wauwatosa, Wis.

BUEMMING and GUTH, Architects

Firm as a Rock

A stone house has a particular appeal to those who wish a home about which associations are to be built, one which promises an unusual degree of permanence, and which will gain in mellowness as time goes on. The house shown on this page exemplifies the use of stone as a veneer, making a splendid home, the upkeep of which is negligible and the economy of which over a house with solid walls of stone is apparent. The design reflects certain characteristics of English homes. Although the cottage feeling has been retained in the exterior design a fine arrangement of eight rooms has been secured in the plan. An unusually pleasant living-room occupies the front wing, and its bay window makes a sunny alcove lending the advantages of a sun parlor yet planned as a part of the living-room without unnecessary separating doors or partitions.

The Plan is Well Arranged with the Living Quarters Entirely Separated from the Two Bed-rooms and Baths on the First Floor. The connection from the kitchen to the garage is admirable. Two fine bedrooms and bath, and a generous, well-lighted recreation room are on the second floor.



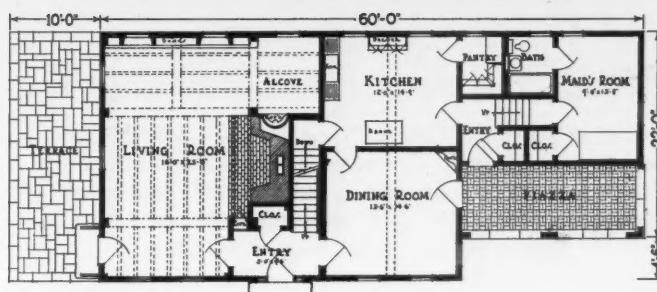
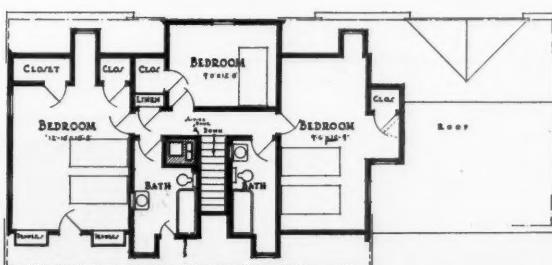


ADDEN, PARKER, CLINCH & CRIMP, Architects

Residence of
HARRY A. GREGG

Nashua
New Hampshire

SECOND FLOOR PLAN

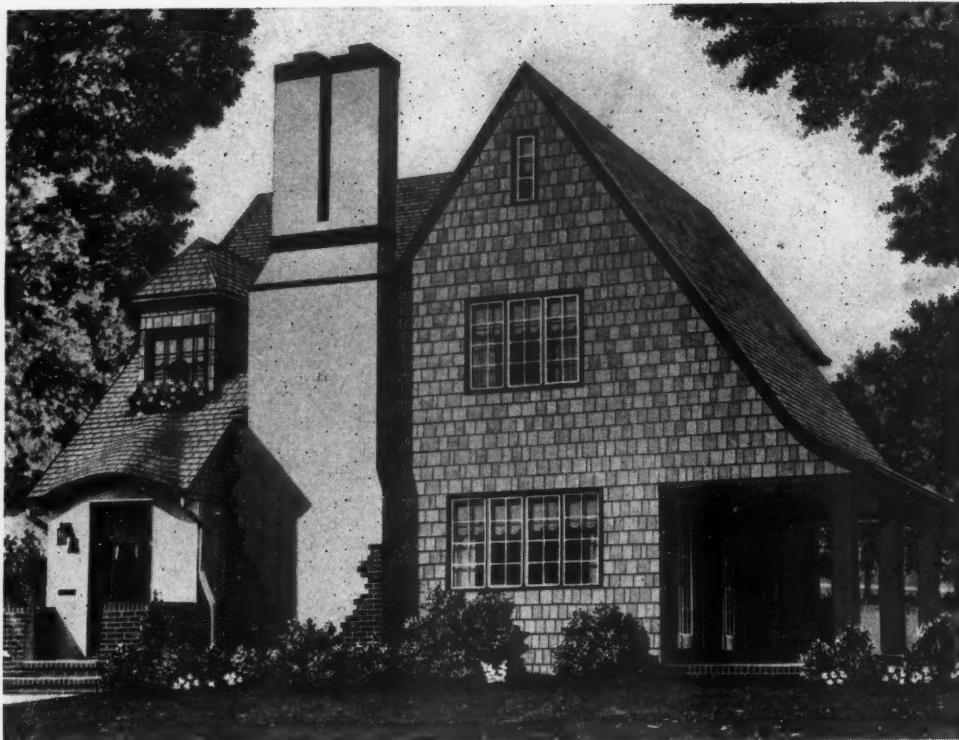


FIRST FLOOR PLAN

**Prim and Quaint
is the
Cape Cod Colonial**

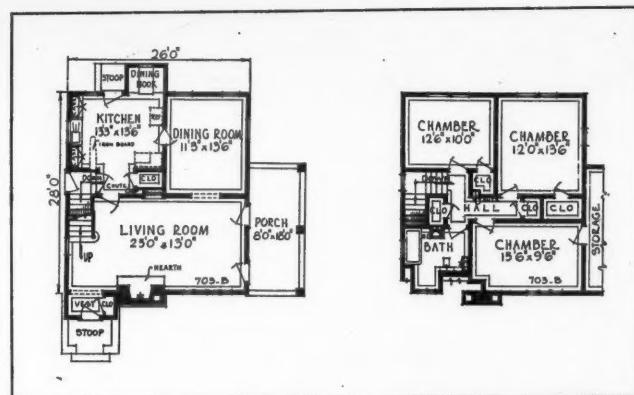


In old New England, the Cape Cod style is completely at home and it can there be reproduced in all its original purity. The style gives opportunity for many pleasing variations for present day needs and in this New Hampshire residence the architects have succeeded in retaining the traditional feeling to perfection. Note the variation in the siding space exposed to the weather and the placing of the roof dormers. The interior photo reveals a living room that follows the spirit of the style in its finish and appointments.

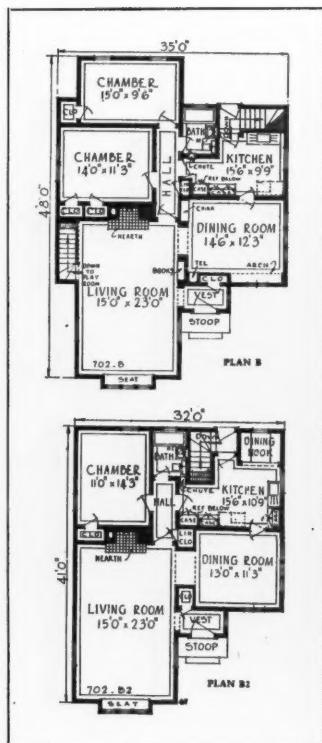


No Argument about These

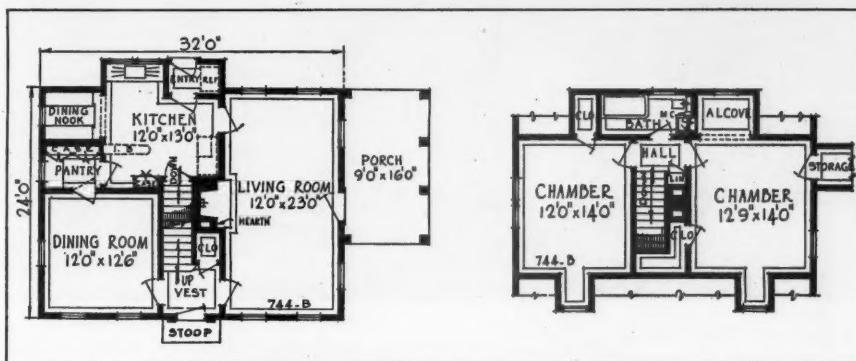
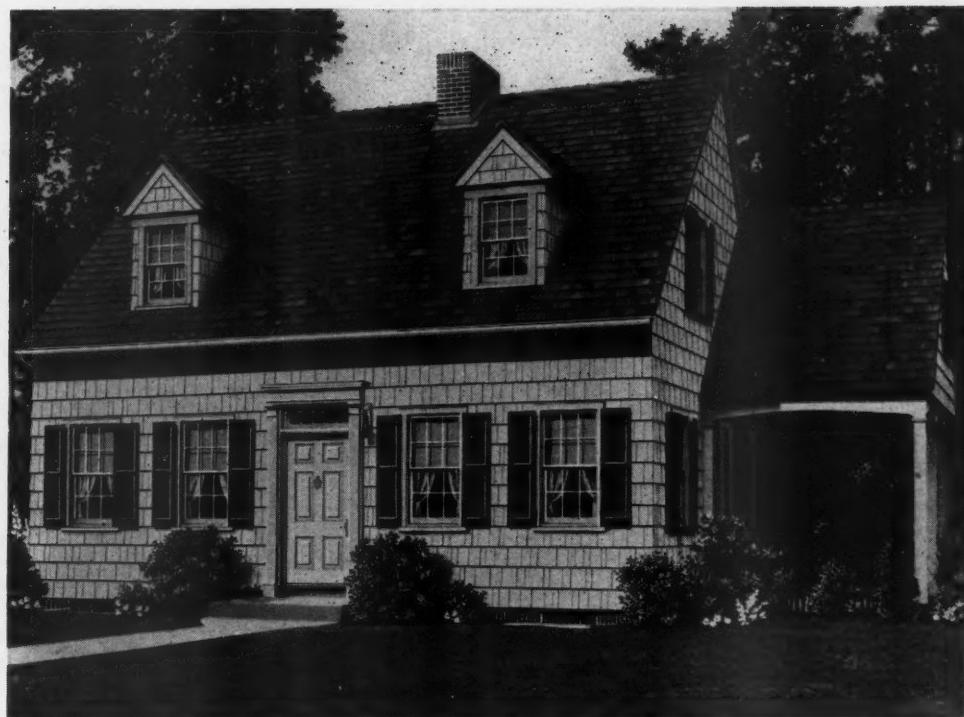
The Design Above is One of Those Tricky Little Englishmen Now so Much in Favor. Six rooms and bath are contained in 26 by 28 feet. Below is an artistic ell-shaped bungalow. Plan B shows five rooms and plan B2 of slightly smaller dimensions shows four.



NATIONAL PLAN SERVICE Designs, Chicago

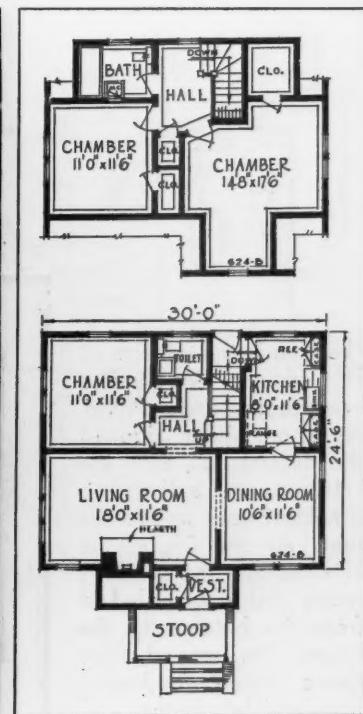


The Style That Sells



The Charm of the Colonial Never Lessens, and for the Smaller Home it Seems Particularly Appealing. Above we have a five room Colonial 24 by 32 feet, while below is a cute little English cottage of six rooms.

NATIONAL PLAN SERVICE Designs, Chicago

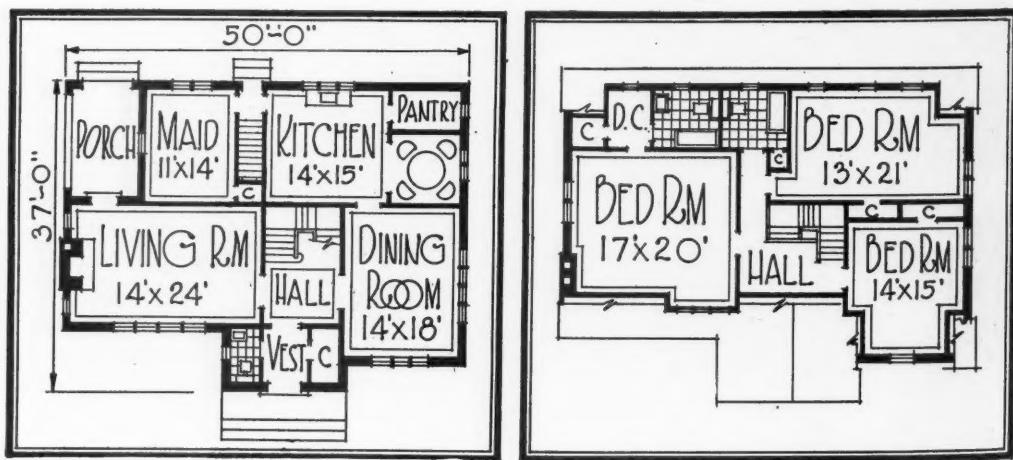




Excellent Proportions

This small house of brick shows a number of English tendencies in the design, particularly in the height of the gable and the half-timbering work. The appearance of extreme height has been appreciably lessened by the introduction of gabled projections of different heights at the front of the building, and the small dormer above the living-room windows is another factor in the effective breaking up of the large roof surfaces. Ornate details have not been resorted to in the design. Notice the manner in which brick has been used in the risers and floor of the entrance platform and also in the jambs of the doorway which is recessed back from the walls of the severely plain entrance.

The Plan is the Feature of This House. We find a living-room and dining-room on either side of the central hall, with the kitchen and adjoining breakfast nook well to the rear. At one side of the kitchen is the maid's room, entirely isolated from the balance of the house. The second floor shows three bedrooms and two baths.



WILLIAM C. HALBERT, JR.

Architect

PHILIP COLTON

Builder



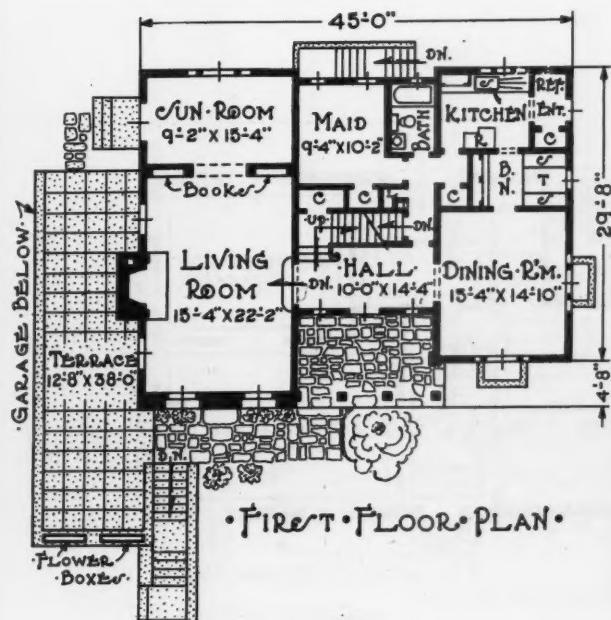
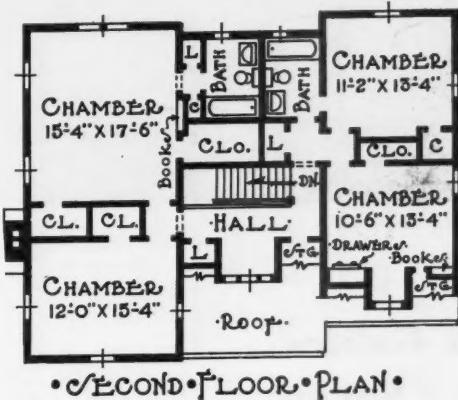
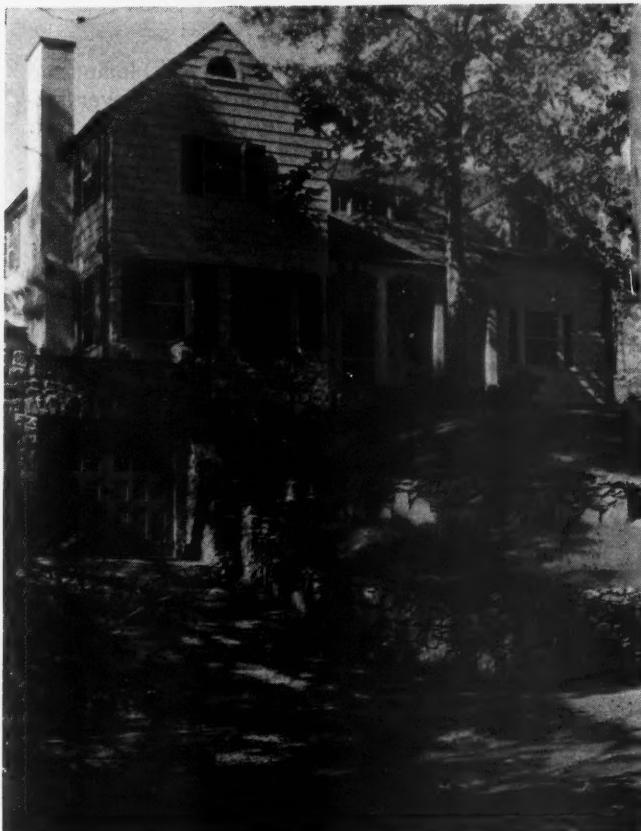
Crowning the Hill

Residence of

JAMES HAROLD KING

Larchmont, New York

EFFECTIVE use of the bank of a hill for a garage area is shown here. The stone construction blends in well with the retaining walls of the lawn terraces and the roof serves well as a terrace. One of the construction features of this house is that one line of pipe serves baths, laundry and kitchen. This is excellent planning in a house of this size.

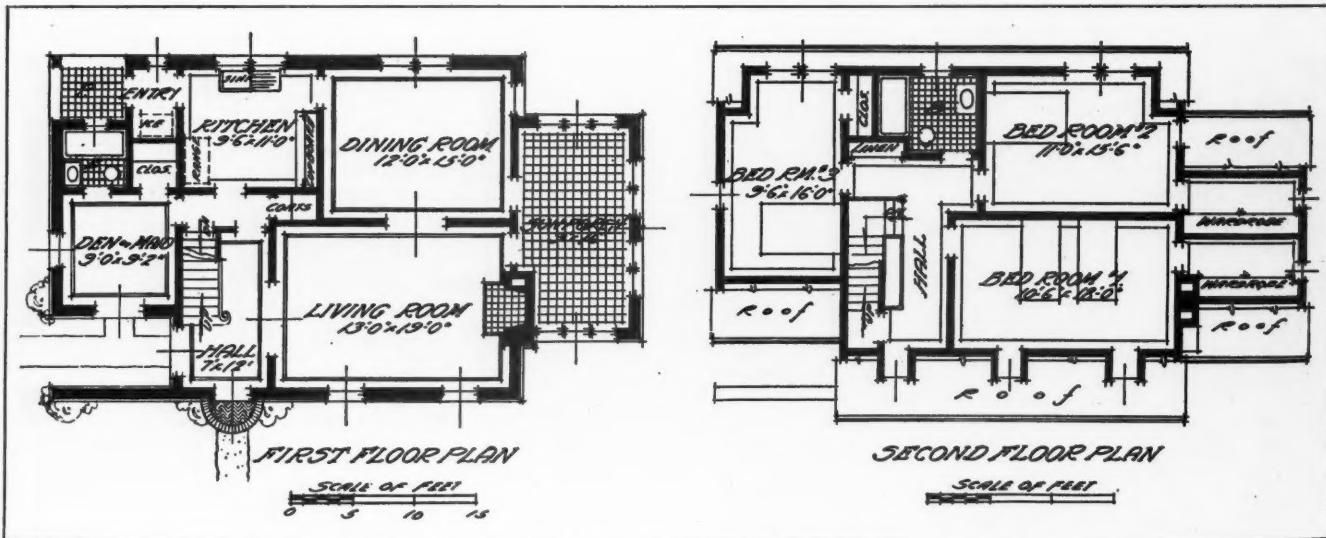


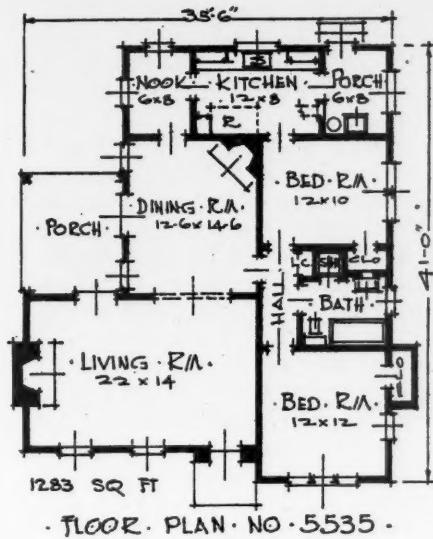


R. C. HUNTER, Architect

With Gables Six or Seven

A Touch of the Quaint is Relished in the Small Home; and Here We Have It in Ample Measure. Stucco over masonry or metal lath, well insulated, makes this home snug and enduring. The arrangement of rooms is commendable.

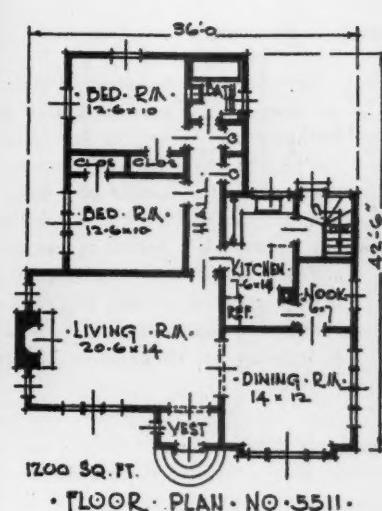
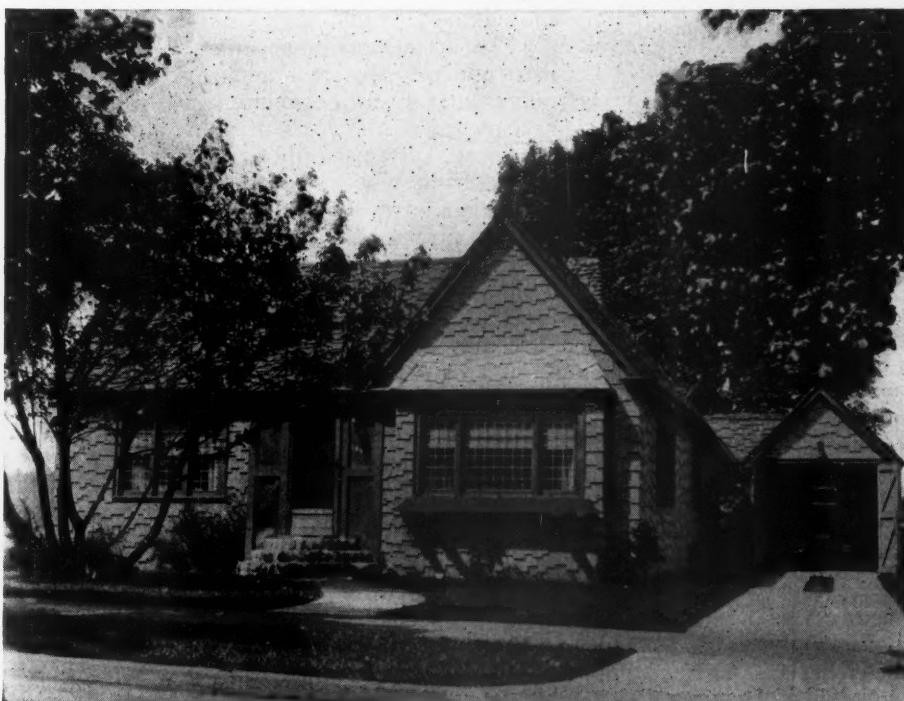




Two Western Bungalows

Out in the Wide Open Spaces the Home Designs Are Low and Broad—Delightful to Live in and Full of Personality. We show two choice examples here. The one above is known as the Monterey type. The average sized family will be very comfortable in this. The exterior is neatly finished with a combination of materials that are typical to this particular design. Below is a design of about the same size. The exterior design with shales laid in staggered rows is a very attractive feature of this home. Leaded windows and the high gabled roof are English.

A. B. CLEVELAND Designs, Los Angeles



How to Make an Accurate Preliminary Estimate

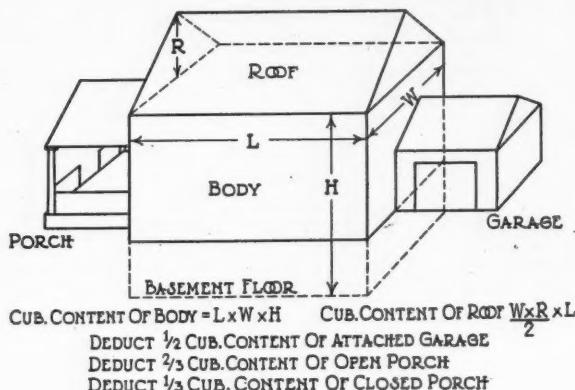


Figure 1

LONG years of experience and many costly failures have demonstrated that the only way to make a thoroughly satisfactory complete estimate of the cost of a house is to take off the detailed quantities from the plans and figure the costs on the basis of current labor and materials. But there are times when a preliminary estimate is very desirable; sometimes before the complete plans are available. What then?

The most commonly used and commonly abused system is the cubic foot method. Simply stated, it consists of figuring the cubic contents of the house and multiplying by an assumed cost per cubic foot. It sounds simple, and is, but this method is so unwisely followed and so misused that it has probably cost contractors more money than it has helped them make; it permits big mistakes to be easily made. It is better to make no preliminary estimate at all than to make one that misses the mark.

There are two primary dangers connected with the cubic foot system. They are: (1) The correct rule for figuring cubage is not fully followed, and (2) The cubic foot cost is assumed without a proper background of knowledge, care, experience, or foresight.

Point one can be easily corrected. There is a simple rule for figuring cubage, and it should be followed exactly regardless of whether you want the house to turn out differently or not. The method commonly used is as follows:

First: the total contents of the structure are computed by measuring from exterior walls to exterior walls and from cellar floor to finished roof. Where the roof is irregular or fairly complicated, don't guess at its contents but figure it mathematically. Stated simply the cubic content of a house is found by multiplying the length times the width times the height. (See fig. 1)

Second: the following deductions should be made:

- Figure open porches as $\frac{1}{3}$ rd their actual cubage
- Figure closed porches as $\frac{2}{3}$ rd actual cubage
- Figure garages attached to house as $\frac{1}{2}$
- If house has no basement, figure from underside of ground floor

Very often an architect or contractor is so anxious to have the cubic contents of a house fall within a given figure that he unconsciously stretches his figures one way or the other to make it do so. This, of course,

defeats the purpose of the estimate. Such a rule as the one above should be adopted, and then stuck to consistently so that the same basic cubage figures will apply to all houses built.

The second danger listed above, and far more difficult to avoid than the first, is that of going astray in setting the unit cost per cubic foot. Small structures, and small houses especially, are hardest to estimate by the cubic foot system because anyone of a large number of items, materials or equipment may so easily upset the basic cube rate. It is easy enough to say that because a certain type house cost 45 cents a cubic foot a new one somewhat like it will run about the same. But a slight variation in the plumbing, bath fixtures, heating plant, paint job, floors or other items will throw off the figure.

Another point that often upsets calculations is excess basement or attic space, although in this respect the error is likely to be on the right side. For example, cubic foot cost is usually based on a house having an average basement and attic area. If the unit price is 45 cents, it is probable that the actual basement or attic cost is much less, let us say 15 cents. Now if the house has an unusually large basement or attic space, and this space is figured in at 45 cents per cubic foot, it will run the estimate up higher than the actual cost will be. In fact it is said that this method is sometimes used purposely to secure a higher valuation from loaning companies who apply a certain price per cubic foot for the entire cubage without deducting for the extra large attic or basement space.

On the average small house, the variation in quality, type of fixtures, extras, etc., may make the cubic foot cost vary anywhere from 30 to 60 cents, or the total cost of the house from \$4,500 to \$9,000. So it is apparent that something more than a superficial guess or "hunch" is necessary to determine the unit cost to apply in making a preliminary estimate if that estimate is to be at all accurate.

The best and perhaps we might say the *only* way to make quick but accurate preliminary estimates is to build up a record of the costs of work already done or now under way, systematically arranged, for quick reference in figuring new projects. Insurance companies base all their business on "experience tables." This is what the contractor should do: make up experience tables based on work done.

As soon as possible, start keeping a careful record of the cost of every project with which you are connected, breaking down the cost into convenient divisions. A simple form for this purpose is suggested in Form 1 which is an ordinary $8\frac{1}{2}$ by 11 inch sheet of ruled note paper punched to fit a loose leaf notebook of this size.

To begin with, every job should be given a number; and all labor, material and equipment costs should be charged to it as soon as incurred. This may be done by use of a "distribution book" such as is employed by the John W. Murphey Building Company (June AMERICAN BUILDER AND BUILDING AGE) or through the regular bookkeeping channels, or by some such system as entering the charges daily or weekly on sheets of paper clipped together and labelled with the job's number. Most builders, by saving invoices or check stubs, etc.,

FORM 1: Job sheet recommended for recording of construction costs of a house broken down into major divisions and giving unit cost of each operation. Sheet is 8½ x 11 inch ruled note paper for use in loose-leaf notebook.

usually have a fairly accurate record of what is spent on a given job. The important point we are bringing out now is that these costs be figured up and recorded under major divisions in detailed manner such as is suggested in Form 1.

The work of classifying the costs and totalling them up under various important heads such as excavation, foundation, carpenter labor, metal work, painting, etc., can be done in odd hours or when work is slack. A separate sheet should be allotted to each job, general data recorded, and then of utmost importance, the cubic foot and square foot costs computed and entered. The detail with which other items are figured out will depend on time available and how good a job you wish to do. Wherever possible, however, the unit cost of each major operation should be figured, for such costs, when available for a number of jobs, are extremely helpful in making the estimates for new work. Figuring the per cubic foot cost of concrete, or the cost per square yard for painting, though it may seem a good deal of work at the time, is more than worth while in uses to which it can be put, as we will presently show.

In some cases it is well to separate labor and material costs for a given operation, as for example, masonry in Form 1. For reference purposes labor cost may remain fairly steady, while use of different quality of material will change the cost of that item considerably.

Form 1 provides space for a sketch of the floor plan and a cross section of the house, so that its important features can be immediately noted. Or if a number of houses of this same type are being built, it may merely be referred to as "type so and so."

When building costs are broken down and the unit costs figured and recorded as suggested in Form 1 the builder then has available at his finger tips a complete "cost record" of that structure. In a small space he has all the essential facts. If someone comes in and wants an estimate on a similar house, he can refer to the complete record in an instant. Furthermore, with the unit costs right there, he can apply these figures to larger and small jobs of the same general class. When a number of such sheets have been filled out, the builder has built up an experience table that is priceless.

JOB SHEET				
House FOR <u>R. A. Smith</u>	Job No. <u>231-A</u>			
Location <u>19 West 8th St.</u>	Type <u>Ex-Galler</u>			
Date Started <u>May 10, 1930</u> Date Finished <u>Sept. 5, 1930</u> No. Rooms <u>6</u>				
GENERAL DATA:				
Total Cost - \$8,806.00 Size - 34' x 45' Construction - solid brick Concrete fndn. & steps Maple floors Insulation, weatherstripping		 		
ITEM	DESCRIPTION	No. UNITS	TOTAL COST	UNIT COST
TOTAL FLOOR AREA CUBIC CONTENTS		1,530 sq.ft. 18,360 cu.ft.	\$8,806.00 \$8,806.00	\$5.75 .48
PERMIT INSURANCE EXCAVATION FOOTINGS FOUNDATION WALLS	Home Insurance Company Level ground, black soil 6" x 18" reinforced concrete Outer - concrete 12" - 1106 cu.ft. Inner - 8" - 196 cu.ft.	450 cu.yd. 150 cu.ft.	10.00 35.00 100.00 120.00	.25 .80
BASEMENT FLOOR PORCH FLOOR OUTSIDE STEPS WATERPROOFING CARPENTER LABOR LUMBER INSULATION FLOORING KITCHEN LINOLEUM ROOFING MILLWORK & CAB. GLASS SCREENS WEATHERSTRIP METAL WORK BRICK BRICKLAYERS' PAYROLL ROUGH HARDWARE FINISH HARDWARE TILE TILE LATHE PLASTER PLUMBING	Cement plaster & asphalt Six men #1 kiln dried fir & white pine #1 maple A inlaid, on felt Tapered asbestos Oak and birch Plate throughout Bronze mesh All outside openings Copper ridge, valleys, flashing	1,302 cu.ft. 510 cu.ft. 16 cu.ft. 1,100 sq.ft. 590 hrs. 1,800 sq.ft. 1,200 sq.ft. 95 sq.ft. 20 squares	410.00 90.00 30.00 55.00 650.00 210.00 170.00 110.00 285.00 600.00 500.00 40.00 135.00 225.00 42.00 330.00 400.00	.32 .20 .89 .05 1.00 22.00 125 .44 11.35
HEATING PAINTING DEC. & WALL PAPER ELECTRIC WIRING ELECTRIC FIXTURES FLOOR SANDING	Bathroom, floor & wainsc. 6' matt Kitchen-cntr. above sink, matt glz. Metal 3 coats 1-pc. closet, china lav., tub & shower, flt. rim sink, laundry tubs Vapor vacuum system 3 coats outside; ins. stain, enamel Best qual. paper; wash. cloth in kitchen 45 outlets Med. qual.	1,100 sq.yd. 1,100 sq.yd.	650.00 575.00 430.00	.30 .37
		1,125 sq.ft.	215.00 135.00 145.00 45.00	3.00 .04

Working with these figures will also develop the "cost sense" that is so valuable an asset to the successful contractor.

Recording of these sheets alone would be a big step forward in the business management of many contractors. But the work should be carried still further. Form 2 suggests a simple method for recording the total cost, the cubic foot cost, and the square foot cost of all houses built, taking the data from the Form 1 job sheets. When recorded in this fashion, it is possible to compare the unit costs of a number of houses of the same type at a glance. With this summary before him, the builder is in a position to tell pretty closely what the unit cost of a proposed house will be, if it is of the same general type as he has recorded.

Sheets similar to Form 2 may be made up for each type of structure which composes an important part of the builder's business. One sheet may deal with solid brick houses in a certain price class, another may record only frame story-and-a-half cottages under \$9,000. The vital point is that the unit costs so recorded apply to the *average* house in that particular class. Where the unit cost of a house in that class varies from the average or normal, it must be because some of its equip-

SOLID BRICK WALLS (HOUSES)

MATERIAL COSTS

DATE	JOB#	SOLD TO	DESCRIPTION	TOTAL COST	COST PER CU. FT. OF WALL
7-6-30	# 66	J. R. Frame	running bond, common back up, 8"	\$490.00	.42
6-1-31	#450	James Smith	8" common	410.00	.38

CONCRETE WORK (HOUSES)

MATERIAL COSTS

DATE	JOB#	SOLD TO	DESCRIPTION	TOTAL COST	COST PER CU. FT.
5-5-29	#242-b	R. F. Jones	4" reinf. basement floor	\$85.00	.28
7-13-29	#260	H. F. Clark	8" solid concrete fndn. wall	120.00	.26
7-29-29	# 44	C. G. Mogg	6" solid concrete fndn. wall	68.40	.34
5-4-30	#665	R. B. Morse	12" fndn. walls	136.40	.22
5-28-30	# 3	F. X. Xavier	flat slab reinf. basmt. floor 6"	240.00	.38

FRAME HOUSES

5 and 6 ROOMS

COST SUMMARY

DATE	JOB#	SOLD TO	DESCRIPTION	TOTAL COST	SQ.FT.	CU. FT.
5-5-29	#242-b	R. F. Jones	5-room bungalow, porcl. & gar.	36550.00	8.35	35.20
7-13-29	#260	H. F. Clark	6-room, 2-story shingle, type D	9000.00	.38	4.76
7-29-29	# 44	James Skinner	6-room stucco, type AA	8800.00	.41	4.26
4-27-30	# 2	Bill Fowler Jr.	5-room clapbd. cottage	5800.00	.37	3.80
5-30-30	# 36	J. V. Vromme	fc. brok. 2-story & garage	8500.00	.44	5.80
7-10-30	# 70-c	K. C. Kook	Colonial cottage, type Z	7500.00	.39	4.00
8-6-30	# 28	John R. Mott	English 2-story, 6 rooms	9300.00	.42	5.50
6-5-31	#700	Wesley Gratz	Colonial 2-story, 6 rooms	8300.00	.39	4.50

FORM 2: On this 8½x11 inch sheet are recorded the total, square foot, and cubic foot costs of houses of similar type. One sheet is used for each major type.

ment, materials or other features are out of line with its class. When this is the case, notation to that effect should be made. It is obvious that the value of the data recorded on Form 2 is greatest when it is applicable to the *average* house of this class, and when a proposed structure has features that are out of the normal, cost adjustments must be made accordingly.

Forms 1 and 2 together will enable a builder to substitute first class, accurate experience data for guesses or "hunches" in making a preliminary estimate of the cost of new work. But the thoroughgoing man will carry his records one step further by classifying material costs as suggested in Form 3 (a or b). It is already clear, of course, that the data in both Forms 2 and 3 are merely copied from Form 1. It is office work that can be done during the slack times.

Form 3 provides a method for recording the unit costs for various classes of work, materials or equipment that go into the building of the structure. A sheet might be made up for each of the important con-

FORM 3: (a and b) Unit costs of various types of material, equipment, and important building operations are recorded.

struction divisions suggested in Form 1. It is hardly necessary to point out how valuable such data as shown in Form 3 under "Concrete Work," for example, would be, not only in making up the preliminary estimate, but in making the

final estimate. For work of a certain class, these data show the cost per cubic foot of various thicknesses of concrete floors, walls, or foundations. The classification may be carried out to almost any degree desired, and when enough average jobs have been recorded, it should be possible to arrive at an "average cost" for that particular type of work, which can be applied to proposed work with a fair degree of accuracy.

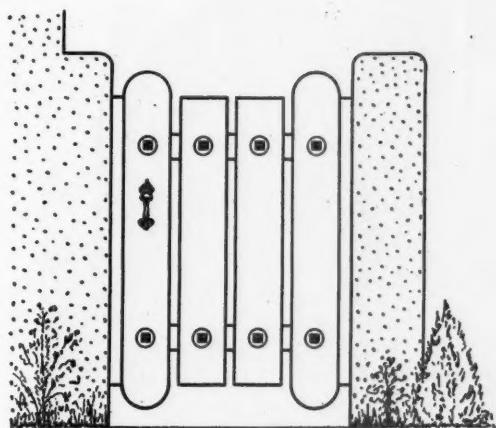
Sheets of the Form 3 type may be used to especial advantage in recording the sub-contracts let for various jobs. One sheet might be devoted to heating sub-contracts, showing in addition to the total cost, the cost per cubic foot of contents and the cost per square foot of radiation. Costs of complete plumbing of various types or the cost per unit of installation might well be recorded in this fashion where they will be immediately available not only in making new preliminary estimates but in checking proposed new sub-contract prices.

Using the data assembled and recorded in Form 1 it would be possible for the builder to make up various other useful and valuable tables, such as for instance the cost per square of various types of roofing or flooring, or the cost per unit of various types of windows, doors, etc. A schedule might be made up to show cost per 100 sq. ft. of brick and tile walls of different thicknesses

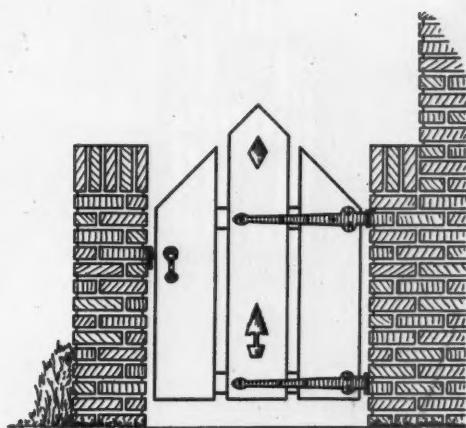
ranging from 4 inches to 12 inches using face brick ranging in price from \$20 to \$50 per 1000. Cost of plastering or painting per sq. yd. could be shown, or cost of electrical work per outlet for different types of work. Such data as these may of course be amplified and checked by reference to estimating books, building and architectural magazines, municipal building figures, etc. In fact, by such checking the builder can soon tell whether his costs are in line with prevailing practice, or whether there are inefficiencies or "leaks" that are running up his expenses. Many architects record unit costs in somewhat this fashion and it may be possible to compare notes with them, or with other builders, supply dealers, estimators, or financing institutions.

Even after such data have been obtained from all these other sources, the fact remains that the contractor's own experience tables are his best guides, for they show not what someone else can do the work for, but what he himself can do it for. This is, after all, the *(Continued to page 100)*

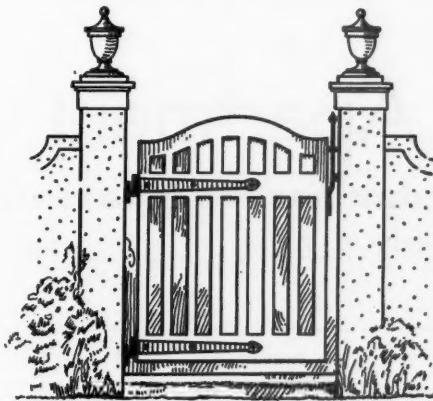
GATES



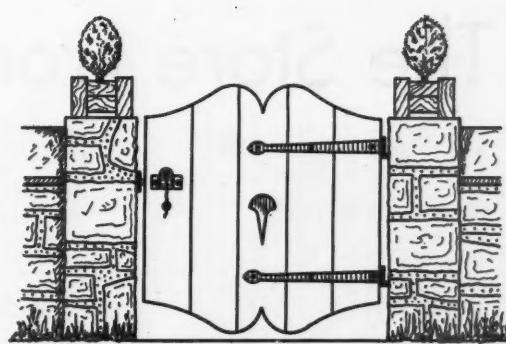
•MISSION•



•ENGLISH•



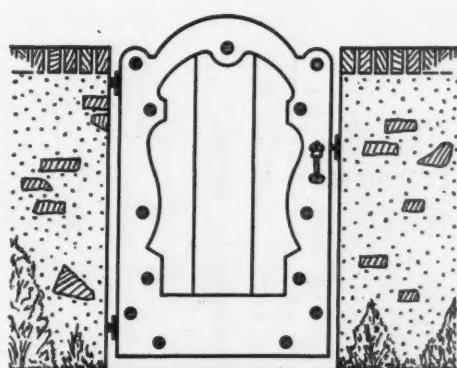
•COLONIAL•



•COLONIAL•

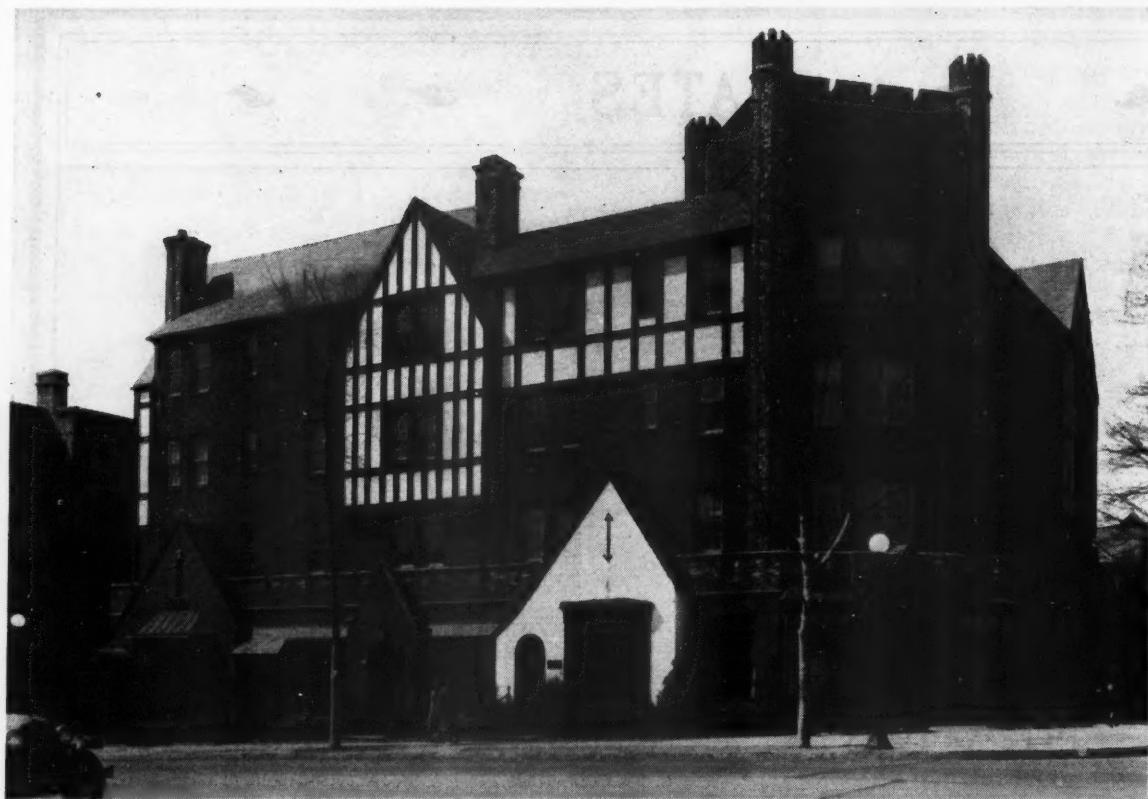


•AMERICAN•



•NORMAN•





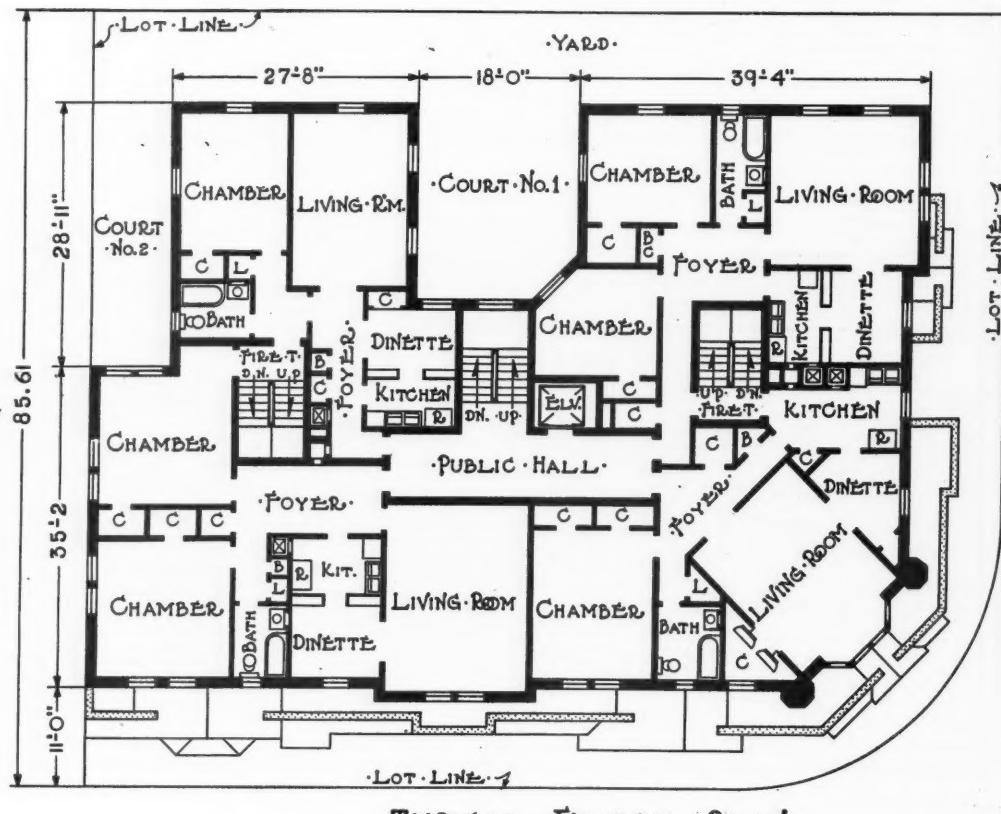
The Store Front Apartment

Cedar Street Apartments
BRONXVILLE

New York

GEORGE F. ROOT 3RD
HAROLD P. ZOLLER
Associated Architects

RIME BUILDING COMPANY
Owner and Builder



GENERAL OUTLINE SPECIFICATIONS

FOUNDATION: Footings, poured concrete—16" poured concrete foundation walls.

FRAMING: Structural steel wall bearing—Floor framing 3"x10"—16" O.C.

EXTERIOR WALLS: 12" brick faced with lammy brick and with oak timbering and stucco.

ROOFING: Sloping roofs, slate—decks, quarry tile laid in mastic.

LEADERS: 16 oz. copper leaders.

FLOORING: Double floors—rough floors $\frac{7}{8}$ " N.C. pine. Finished floors No. 1 white oak. Building paper between floors.

INTERIOR FINISH: Walls and ceilings: 3 coats plaster on wire lath. In halls, white coat given parged finish.

PLUMBING: Brass supply pipes, hot and cold throughout.

HEATING: Oil burner heat with vacuum system. "Cor-to" radiators.

CLOSETS: Ample closets with shelving, clothes rods, shoe shelves.

KITCHENS: Gas ranges, electric refrigeration, sink, laundry tray, dressers, linoleum floor covering.

BATHROOM: Wall finish, tinted tile wainscot with ceramic tile floors. White "Standard" fixtures and "Fair-facts" steel medicine cabinets. Built-in recessed tile accessories.

ELECTRIC FIXTURES: Of varying designs in pewter, brass and enamel. Ample switches of toggle type. All wiring in BX cable and installation approved by National Board of Fire Underwriters.

INCINERATORS: "Kernerator," with hopper door for each apartment to combustion chamber in basement.

DETAIL OF STORE FRONTS

CEDAR STREET APARTMENTS

It is becoming more and more necessary to make the design of store fronts in apartment buildings conform to the residential character of the neighborhood rather than to the commercial character. In this building the architects have succeeded in achieving an interesting and varied succession of store fronts that actually add to the appearance of the building as a whole.

DESCRIPTIVE DATA

Date of completion: May 1, 1929

Cost of construction: \$140,000 (per cu. ft.) 50c

Total number of apartments: 16

Total number of apartments per floor: 4

Number of rooms per apartment: 3½ & 4½

Total number of rooms: 74

Apportionment of apartments throughout building: 4 each on second, third and fourth floors

3½'s: 12

4½'s: 4

Average area of living rooms: 290 sq. ft.

Average area of dining alcoves: 70 sq. ft.

Average area of chambers: 230 sq. ft.

Average area of kitchens: (including dining alcoves): 140 sq. ft.

Total number of stores: 5

Area of stores: 600 sq. ft. each

Elevators: (number) 1 (type) 5 button automatic (Otis)

Ground coverage: 65%

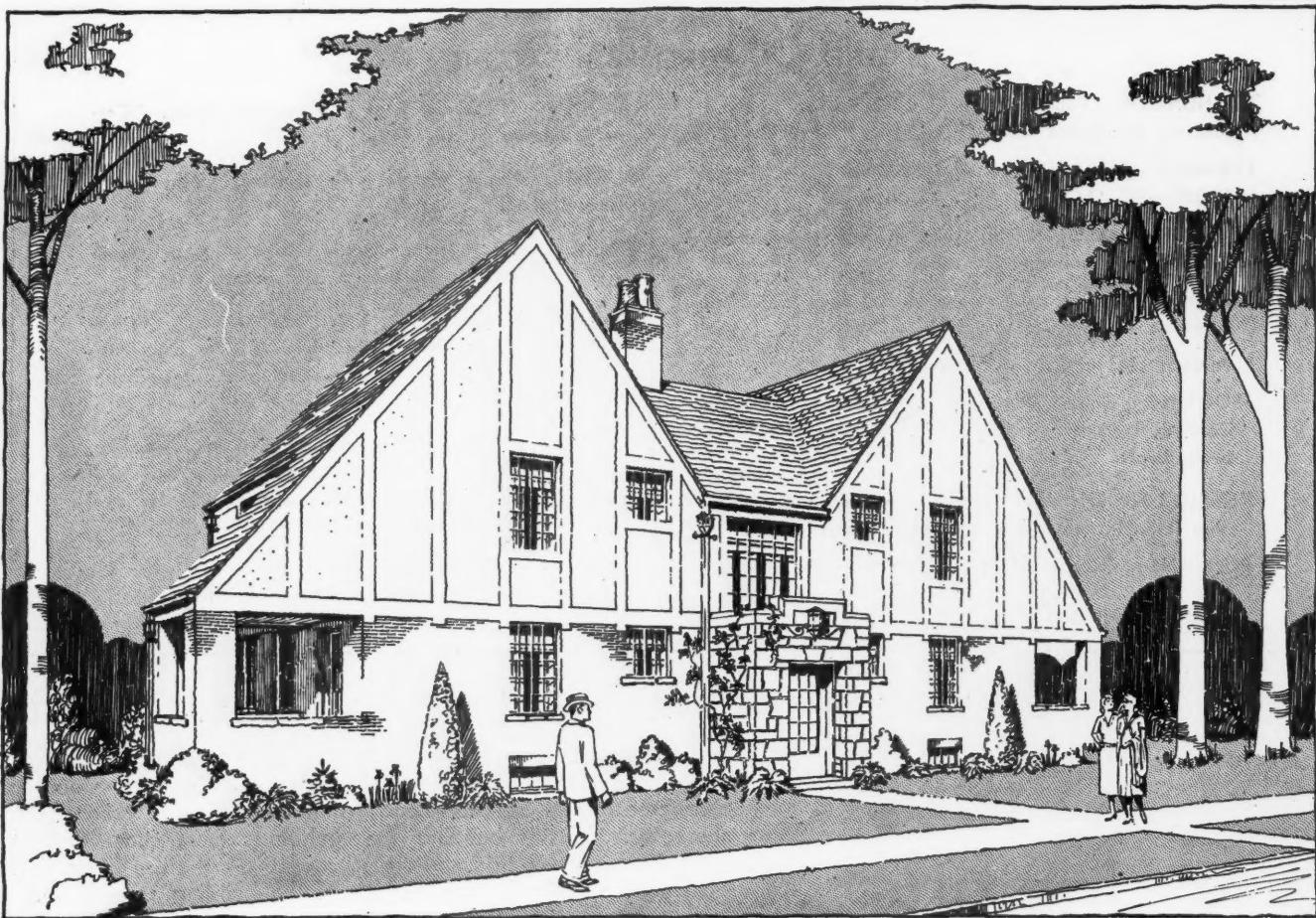
Average area per room of building area: 88 sq. ft.

Average area per room of lot area: 135 sq. ft.

Height of ceilings: 8 ft., 6 inches

(Dining alcove designated as ½ room)

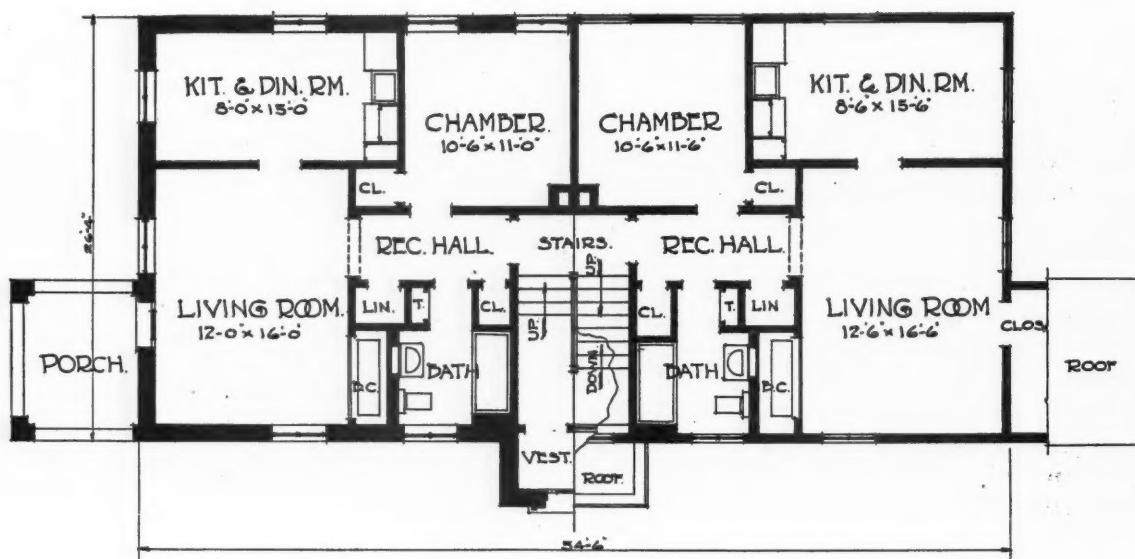




WM. G. KRIEG, Architect.

Four Apartments Well Disguised

An Income Property Cleverly Masqued to Fit in Gently on Any Residence Street. Four efficiency 3-room units are contained in this attractive structure.

1/2 PLAN 1ST FLOOR1/2 PLAN 2ND FLOOR



The House of the Month

**Charming Little English Design Built at
Glenridge, N. Y.; R. C. Hunter, Architect;
Chosen as Most Meritorious Six-Room House**

HERE is an air of smartness, and also a home-like quality, about this design which makes it a favorite. Compact in outline, it is economical to build, and yet the sweep of the roof lines and the good proportion of the various parts combine to produce a very pleasing design. The salability of this type of house in the "ready to move in" market has been demonstrated time and time again.

The dimensioned floor plans, front elevation and cross section presented on the accompanying pages, all drawn to the scale of one-eighth inch to the foot, show clearly the many carefully thought out details of this design. The entrance vestibule is of good size and well equipped with two closets for outdoor wraps. Entrance into the living room is close to the foot of the stairs to the second floor, permitting anyone to pass in and up without much disturbance to the rest of the room. The living room, itself, is of generous proportions, thirteen by nineteen feet, and the big sun porch extending clear across the end of the house, eight by twenty-six feet, adds to the

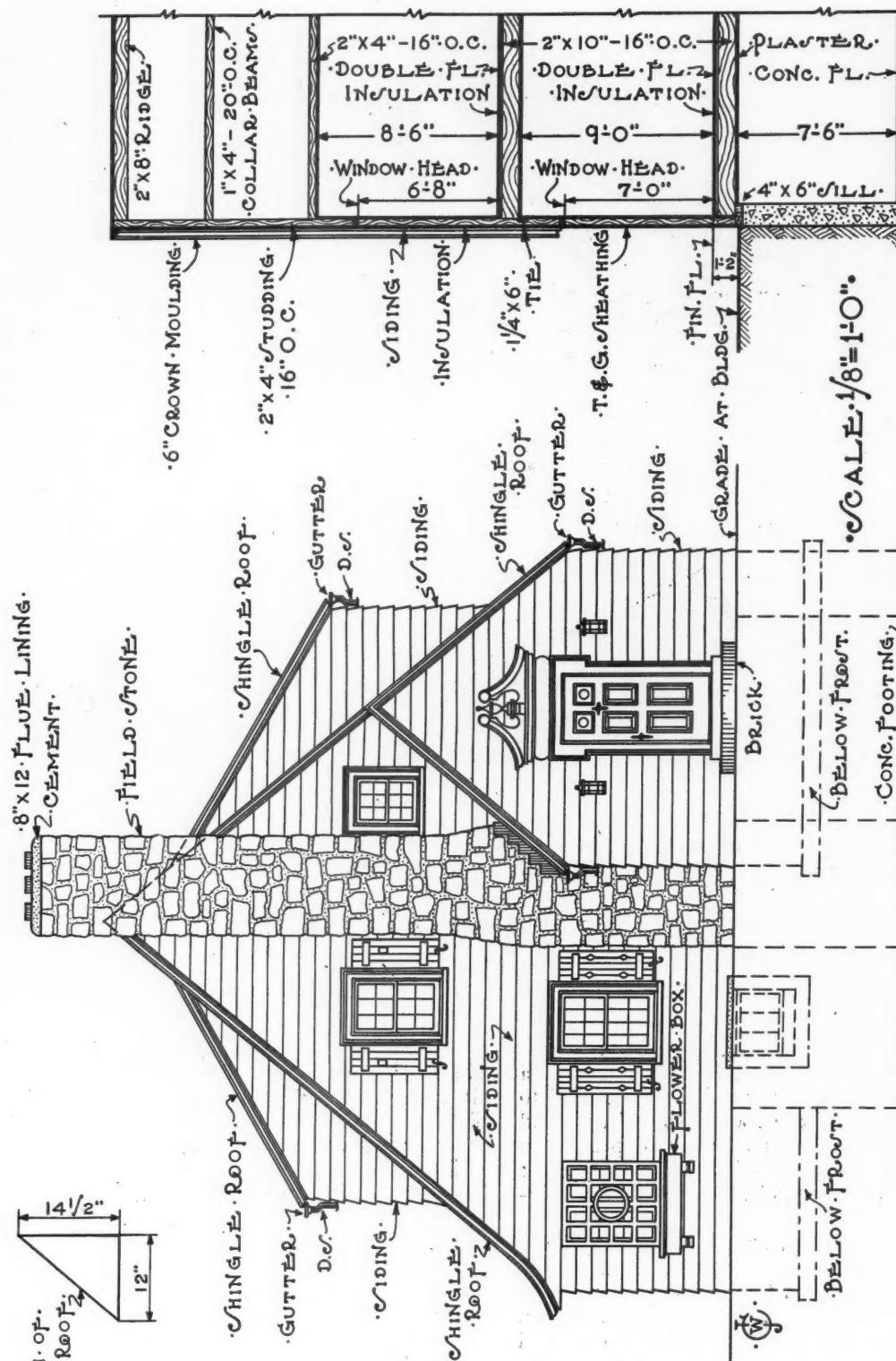
roominess of both the living room and the dining room. The kitchen is a very pleasantly arranged room with plenty of cupboard space, four windows and cross ventilation. The alcove, with built-in table and benches, is an appreciated convenience.

The second floor of this home has three good sized bedrooms, each with clothes closet. The bathroom is off the hall at the head of the stairs, making it convenient to all.

In line with modern home-planning thought, the basement of this home is developed into a real part of the home. The hall and game room are partitioned off from the laundry, heater room and fuel storage so that full enjoyment may be had of these social facilities of the modern basement. Grouping all mechanical equipment together in part of the space, as is done here, is very desirable.

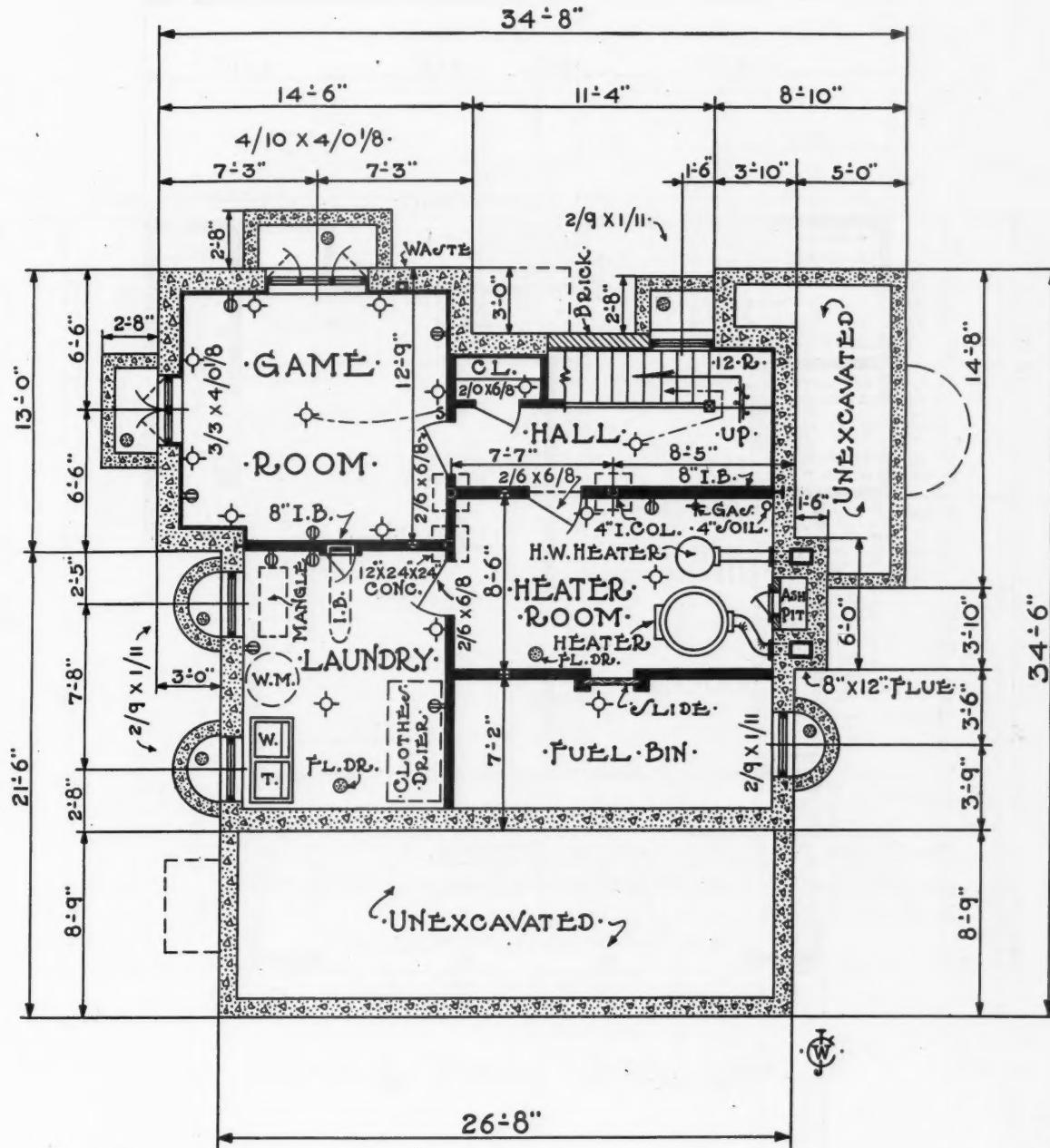
Those planning and building will find many suggestions in these drawings which they can embody in work of their own to advantage.

WORKING DRAWINGS OF THIS HOME ON THE NEXT FOUR PAGES



•FRONT • ELEVATION • SECTION.

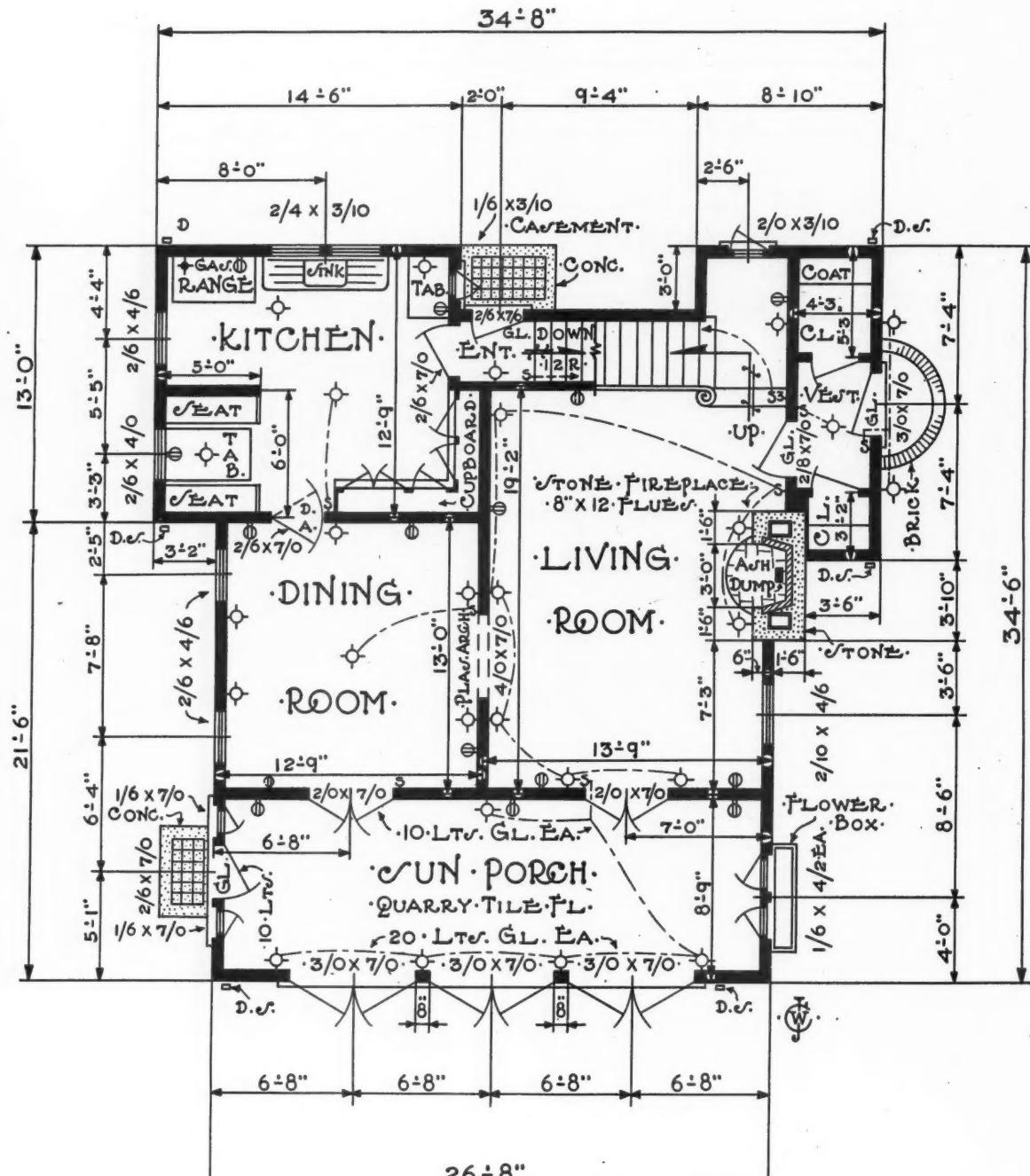
The Entrance Front Is Thirty-four and a Half Feet Wide, the Depth of the House from Front to Rear Measuring Thirty-four Feet, Eight Inches.



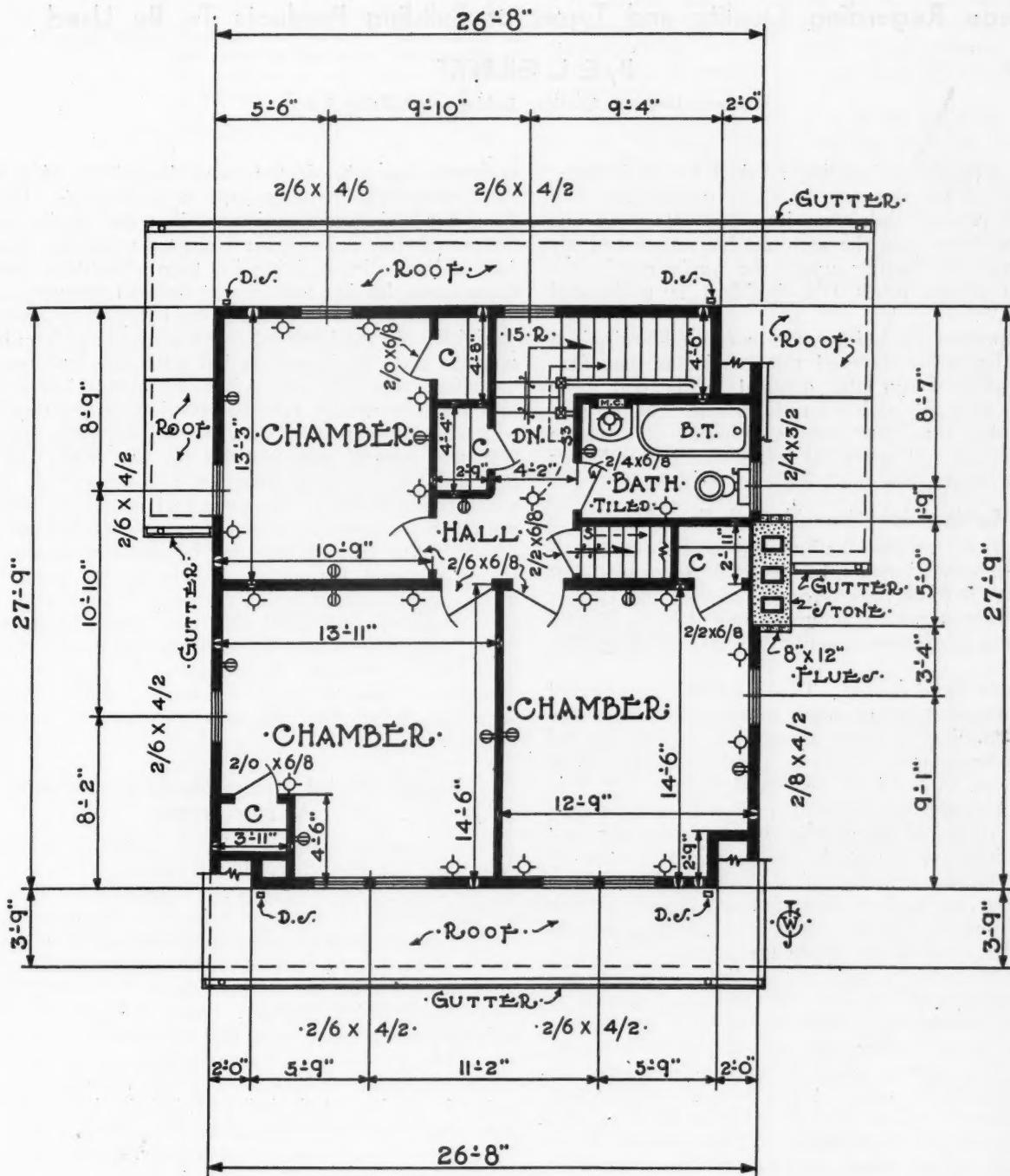
•BASEMENT•PLAN•

• SCALE • 1/8 = 1'-0" •

Half of the Basement Is Designed for Work and Half for Play. If you must have a basement, better build it right so as to get the good out of it.



The Arrangement of the House of the Month Is Well Worked Out for Convenience and Is So Compact That Cost of Construction Is Held Low.



•SECOND•FLOOR•PLAN•
SCALE 1/8=1'-0"

Three Commodious Bedrooms, Each with Cross Ventilation and a Large Clothes Closet Are Found on the Second Floor. Stairs go up to attic storage space.

The Time Element in Construction

Why Changes Are Often Necessary Long After Initial Decisions Have Been Made Regarding Quality and Types of Building Products To Be Used

By E. L. GILBERT

Research Director, American Builder and Building Age

NOT long ago a building product manufacturer said to the writer: "I don't understand why my product didn't go into that West Avenue house. The owner and the architect both approved my product—but the builder upset the apple cart! I'm very much afraid Jones (the builder) is prejudiced against me."

As it happened the builder was *not* at all prejudiced—in fact, he rather favored this particular manufacturer's product. But the original plans had been changed because less money had been obtainable on first mortgage loan than had been anticipated. It was a change in plans and operating policy due to conditions which arose during the third stage of the job.

Every Building Job Goes Through Four Stages

Regardless of whether the building job may be classified as residential or non-residential, there are four stages which it must pass through. Sometimes two or more of these stages of progress may develop during the same time period, but usually they take the following order:

Decision to Build Period: This is an indefinite period of time and cannot be accurately measured. In the case of home building, owners sometimes require several years to make up their minds to spend the money for a new home, or to build on borrowed money. In non-residential building this stage of a job may include such things as surveys of the rentability of office space in a particular locality, the study of specific corporate finances or the accumulation of a "building fund" by a manufacturer, as well as preliminary discussions with financing interests. In this stage of a building job the builder often operates to speed up matters by helping the owner to reach a decision; in home building and non-residential work too, the builder is often able to reassure the owner as to financing, etc. In the case of speculative home building the builder carefully guides the prospective home owner through this stage when he first interests the prospect in a home.

Design Period: After the owner has decided to spend the necessary money for building, it then becomes necessary to work out the exact design of the structure. This is where the architect functions; it should be noted that even in the great number of cases where the architect is not directly employed to design, the basis of the majority of designs may be traced back to the work of some architect or architectural designer somewhere. A large number of house plans are sold, for instance, through plan service companies via the local lumber and building supply dealer; these plans, turned out on a production basis, were originally designed by an architect. Also, thousands of builders maintain their own architectural staffs and provide plans and specifications for their clients. By co-operating with owner and architect (or designer) during this stage of any building job the builder often renders a most valuable service.

Financing Period: After the design and specifications have been worked up, it then becomes necessary

to finance the job. If the owner has plenty of cash on hand, this stage requires only a short time. On the other hand, if outside assistance be required the financing period may account for from ten to twenty-five per cent of the entire building job time. Builders (and, in many cases, lumber and supply dealers) are very active during this period in helping the prospective owner to straighten out the hundred and one details which always seem to crop up in connection with any building job.

Construction Period: After the owner has decided to spend the money (or that portion of the total cost which he must provide), has decided definitely upon the type and general specifications for the work, and has obtained the necessary financing assistance, then actual construction begins. The period of actual construction ordinarily occupies from forty to seventy-five per cent of the entire time which may be included in the four stages outlined herewith. However, the design and financing periods sometimes take so much more time than originally estimated that the owner becomes extremely anxious to have the construction period cover as little time as possible. It is usual to find pressure being brought to bear to hurry the builder during the construction period; this has some bearing on changes in brand selection.

Building Market Studies Should Contemplate All Four Stages

In estimating potential sales of building field products basic considerations should include all four stages of the building job. In selling electric refrigerators, for instance, much progress is made if the owner is first "sold" on the idea of electric refrigeration so that he will include this equipment in the new structure. Similarly, the architect should provide in the design for the space required for the unit. Since the value of electric refrigeration is now generally recognized, it may help materially to bring to the attention of the mortgage company, bank or other financing source, the fact that this valuable equipment is being included, thus enhancing the value of the entire property. It will be found (and has already been proved) that builders control to a large extent the actual *brand selection* of electric refrigeration. By co-ordinating the sales and advertising efforts to reach the four factors who control all building operations (owner, architect, builder, dealer) and by careful planning to reach these four factors during the most propitious periods (decision to build, design, financing, construction periods), maximum sales may be obtained.

How Much Emphasis for Each Stage?

The relative importance of these four stages varies according to the type of product. Heavy structural products, for example, may in some cases be most effectively promoted during an entirely different stage than would be the case for a building specialty. Special studies must usually be made in the case of each type of product, especially to determine what percentage of

influence is exercised by the four factors; then further study of the stages will often aid materially in shaping a well-knit selling plan.

In general, the four stages referred to in this article have the following relation:

Stage	Time Consumed:
Decision to Build Period	Indefinite and variable. The relation of this period to the entire formative life of any construction work cannot be clearly determined; it may consume as little as five per cent, or as much as fifty per cent of the total time.
Design Period	This period sometimes occupies as little as ten per cent of the total formative life of a job; again, it may account for as much as twenty-five percent of the total time.
Financing Period	Accounts for from five to twenty-five per cent of the total time, on the average. There are exceptions to this (especially during the past two years) but normally the financing period will not consume more than twenty-five per cent of the entire formative life time.
Construction Period	Normally occupies from forty to seventy-five per cent of the total time. This is the actual construction period and does not include any of the time often devoted by the builder to co-operation during the decision to build, design and financing periods.

By "formative life" is meant the entire time from the moment the owner decides to spend money for build-

ing to the day the construction work is finished. As shown for the Decision to Build period, there often (and usually) is considerable background preceding the owner's actual decision to spend the money and there is no way to estimate accurately this entire period; however, it is usually some time after the actual decision is made before the owner begins "to do something about it." Consequently, for all usual requirements, this first period can be roughly estimated, based on the type of construction.

The "formative life" of a home building job might be as follows: Owner decides to build a home on January 1st; engages architect on February first and plans and specifications are completed on March 15th; secures financing by May 1st; home is completed August 1st. This would mean that the Decision to Build Period occupied 14.3 per cent, the Design Period 21.4 per cent, the Financing Period 21.4 per cent, and the Construction Period 42.9 per cent, of the "formative life" of the job.

Where most manufacturers and their sales or advertising managers err is in the fact that they allot too much emphasis to a single period. It is fallacious, for instance, to base all the sales and advertising efforts upon a market analysis which includes only the Design Period—or, for that matter, any single one of the other periods which make up the "formative life" of a job. A well rounded viewpoint must include consideration of all four stages of the job, as well as the degrees of influence exercised in the market as a whole by each of the four factors (owner, architect, builder, dealer). And for maximum sales of any building field product the well rounded viewpoint is essential.



HOME BUILDING IN FOREIGN LANDS: An attractive Alpine Chalet with inscriptions in ornate letters and with pictorial ornamentation at Lenk in the Bernese Oberland, Switzerland.

NOVEL BUILDING METHOD



Temporary Wood Shores on Which the Gypsum Floor Units Are Supported While the Reinforced Concrete Beams Are Being Cast in the Troughs of the Gypsum Floor Form Units.

UTILIZES PRECAST C



Placing the Gypsum Floor Units on the Temporary Wood Shores.

THERE is a big field for the construction of low cost houses that are fireproof; and any system that promises this will be of interest to builders. A novel method of construction which has been devised by a prominent New York engineer for the erection of small fireproof buildings at an economical price is attracting wide attention.

In this new form of construction use is made of gypsum in precast sections. These sections in turn form molds for reinforced concrete beams and columns. The essential units of this system of construction are but three: Exterior wall sections, interior partition wall sections, and floor sections. From a number of these sections an entire structure may be erected.

The gypsum sections are factory made and delivered to the building site ready to assemble. They are light in weight and, therefore, are easily handled. They are cast hollow in molds and come out with a smooth finish. One of the patented devices used to make these sections is the India rubber core. When the gypsum has set the core is easily removed by pulling.

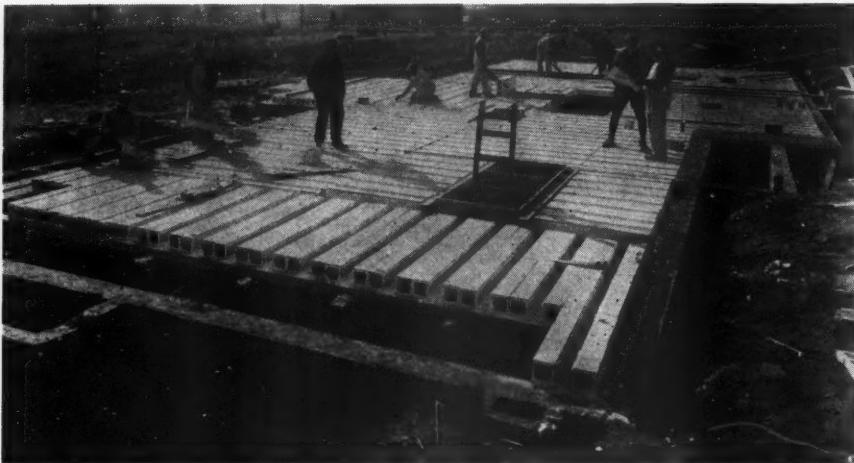
The sectional drawing shows the shapes of the several precast gypsum form units and how they are assembled together to make a building.

The floor sections are delivered in units four to six feet long. There are three hollow spaces running

through the entire length of each piece. The center one is used as a form for a reinforced concrete joist or beam. These floor units are laid alongside each other on temporary shores as shown in one of the photographs and after they are in place the thin web over the center hollow in each unit is sawed away, leaving a trough or form in which steel reinforcing bars of standard design are placed. Concrete is then poured in one operation into these troughs and over the entire floor area to a depth of two to three inches above the top of the gypsum floor units. The units are readily cut to size by hand sawing.

The result is a series of parallel reinforced concrete floor beams or joists running from wall to wall and cast monolithically with a reinforced concrete floor slab. On this slab the finish floor can be laid either of hardwood, tile, composition, linoleum, or any other material that suits the requirements. Sleepers or patented floor grips can be imbedded in the concrete.

The smooth undersurface of these cast gypsum floor units furnishes a ready-built even ceiling, ready



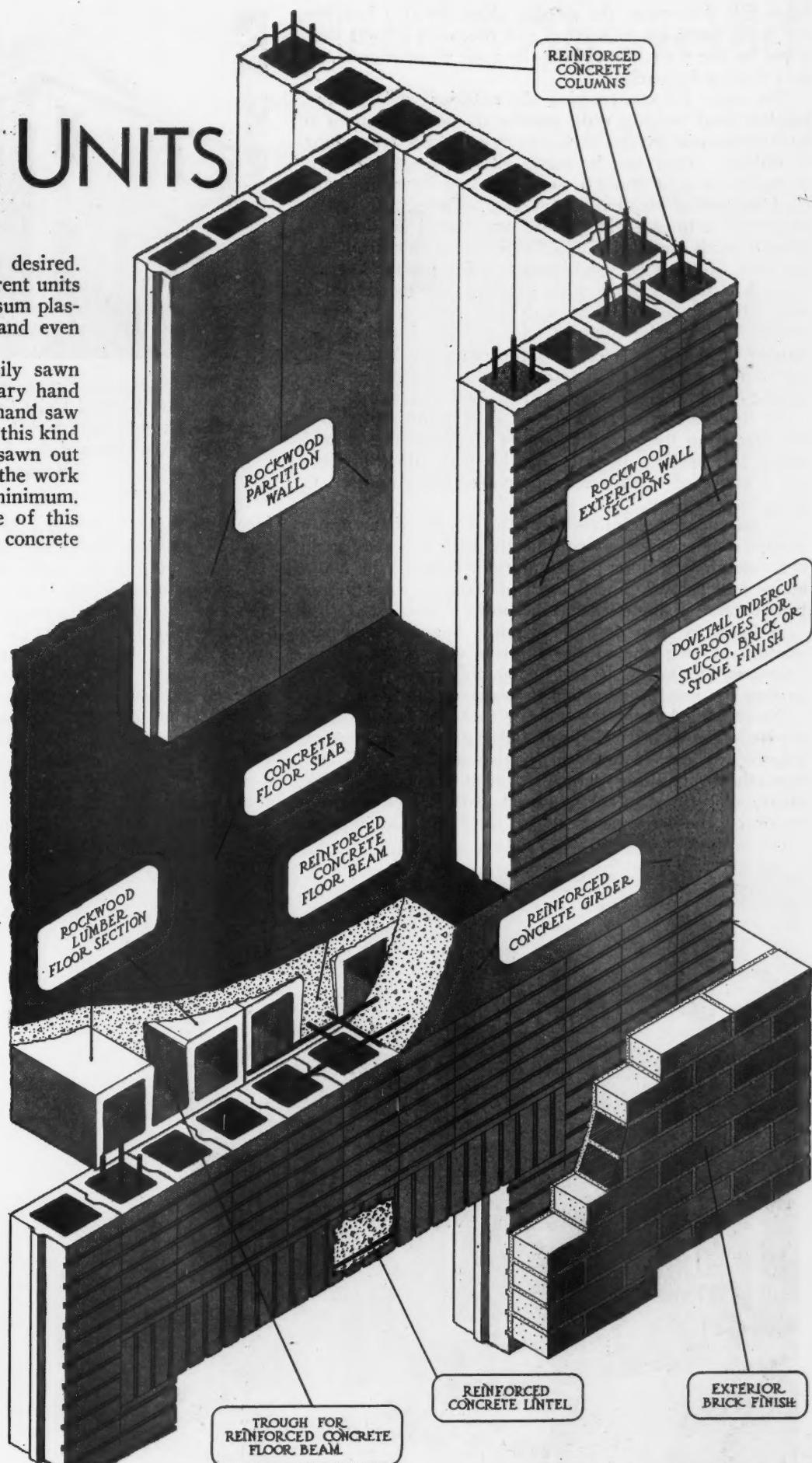
When the Gypsum Floor Units Are Laid the Thin Web Over the Center Hollow of Each Floor Unit Is Sawed Away, Thus Making a Series of Parallel Troughs Which Serve as Forms for Reinforced Concrete Floor Beams Running from Wall to Wall. The concrete is poured over the entire floor surface, thus making a concrete floor slab of any desired thickness with finished plaster ceiling underneath.

PRECAST GYPSUM UNITS

for any decorative finish desired. The cracks where the different units meet can be filled with gypsum plaster to produce a smooth and even ceiling surface.

The webs are very easily sawn out by means of an ordinary hand saw, but a circular power hand saw is very effectively used for this kind of work. The web to be sawn out is made thin at the top so the work of sawing is reduced to a minimum.

Notice the wedge shape of this center trough. When the concrete



Various Precast Gypsum Units Assembled to Make Reinforced Concrete Frame, Curtain Walls, Floors, and Partitions; Also Showing How Exterior Finish Material Is Applied.

beam fills this space, the sloping sides act as a key for the other parts of the section and the more weight that is put on the floor, the tighter the floor units become, as they form a flat arch.

The units for constructing the exterior walls or any interior load bearing walls consist of square sections 6 by 6 inches and extend vertically in one piece from floor to ceiling. They can be made 12 feet long and such a section is light enough so that it can be easily handled and put in position by one man. To secure vertical alignment a tongue and groove are placed on opposite sides of each section. The interior side is smooth, while the face of the exterior is grooved for plaster keying.

Such a wall is built with considerable speed and a minimum of labor. The wall units are set up vertically, and as the tongues and grooves interlock no mortar needs to be used. As the units are hollow the advantages of insulation from dead air spaces are provided; in addition gypsum itself is good insulation.

At intervals, where required, steel reinforcing rods are placed in these vertical units and concrete poured down the vertical hollows of the wall, thus producing a series of reinforced concrete columns encased in a wall of gypsum.

These concrete columns carry the weight of the upper stories and are cast monolithically with the reinforced concrete girders, floor joists and floor slabs of the floors above and below. The floors and walls of the building thus became a single monolithic unit.

A lintel to span door or window openings is easily made by taking one of the exterior wall sections, cutting out the top web and using this as a form for casting the reinforced concrete beam or lintel.

As explained above the exterior faces of the wall units are undercut with parallel dovetailed grooves and waterproofed at the factory to furnish a mechanical and watertight bonding surface for the veneer of brick, stone, stucco, or other material with which the exterior of the building is to be finished. The interior



After the Gypsum Supported Concrete Slab Floor Is in Place, Vertical Units Form the Exterior Walls; Openings Are Left for Doors and Windows and Walls Are Complete Ready for the Exterior Veneering.

faces of these wall units present a smooth gypsum wall, immediately ready for decorative finishing.

Where the interior walls of a building do not carry any weight and merely serve the purpose of partitions, a unit of cast gypsum is used that measures in its cross-sections 4 by 12 inches or 3 by 18 inches and extends in one piece from floor to ceiling.

This interior wall unit is also hollow and tongued and grooved its entire length, and is set up vertically in the same manner as the load-bearing exterior wall units; but, inasmuch as it is not intended to bear any weight, the use of reinforced concrete to form columns in such a wall is not necessary. The tongues and grooves form a strong joint running from floor to ceiling and hold the wall in perfect alignment.



One of the Gypsum Unit Houses Completed in a New York Suburb. A favorable cost record was established, promising eventual savings of a substantial sort.

Questions of Law Clearly Answered

Legal Rulings of Interest to All Builders

By M. L. HAYWARD

A Question of Waiver

THE builder's stock-in-trade has been burned, and he had filed the usual proof of loss with the insurance company.

"We are in receipt of your proof of loss under the above policy, but cannot accept the same as the time at which the fire occurred is not properly set forth," the company replied.

"I am instructing my attorney to bring suit," the builder wrote back, and the case came to trial in due course.

"We object to the proofs of loss furnished, as the location of the property at the time of the fire is not properly set forth," the attorney for the insurance company interposed.

"Here's your letter objecting to the proofs on the ground that the time of the fire was not properly stated, and it's too late to raise a new ground now," the builder's attorney objected.

"Objection sustained," the judge decided—and the judge was right, as the Alabama, Florida, Illinois, Maine, Minnesota, Nebraska, New York, South Dakota and Wisconsin courts have ruled that an objection to the proofs of loss based on a specific ground is a waiver of separate and distinct objections.

Was The Note Delivered?

"I'll have to have security for what you owe me," the builder suggested.

"I cannot and will not give security, but you needn't worry, for I've made out a note in your favor and left it at the bank," the doctor explained.

A few months later the debtor died, the note in question could not be found at the bank, but it was found in the debtor's desk, and the builder sued the estate on the note.

"Writing and signing the note was not enough, delivery was essential, and when the debtor died with the note in his possession there had never been a valid delivery to you," the estate maintained, and the Indiana courts ruled that the builder had no case, as far as the note was concerned, in the case of *Burviance vs. Jones*, 120 Ind. 162.

Sale Without Notice Is Valid

A CONTRACTOR had borrowed money from his bank, pledged certain collateral as security, and the pledge agreement provided that "the said stock may be sold by the said bank, at public or private sale and without notice to the said customer."

"In case of the sale, by the pledgee, of any pledged property, ten days notice in writing of said sale shall first be served on the pledgor," the state law provides.

The note in question was not paid when due, the bank sold the stock at a private sale without notifying the contractor, and the latter objected.

"You were bound to give me a written notice according to the state law," was the contractor's contention.

"The agreement that you signed, authorizing us to sell without notice governs, and not the statute," the bank

argued, and the Supreme Court of Michigan ruled in favor of the bank in a recent case.

Overdrafts Are Demand Loans

"O VERDRAFTS are strictly prohibited by order of the board of directors," a bank announces, and the rule is both safe and salutary.

Suppose, however, that a bank does allow a builder to overdraw his account. What is the relation between the bank and the customer as far as the amount of the overdraft is concerned?

On this point the courts have ruled that the overdraft is to be treated as a loan to the builder, repayable on demand.

"An overdraft allowed is a loan due on demand, and may be sued for as such," says the United States Circuit Court of Appeals in a case reported in 129 Fed. 557.

"Not Less Than Four Years"

A DELAWARE building contract provided that the time in which the contractor should be bound to complete his contract was "not to be taken as less than four years," and a dispute arose as to the interpretation of the agreement.

"You're bound to complete the contract in a reasonable time, and if a reasonable time is less than four years, you've got to have the contract completed by that time, or I can throw you off the work," was the owner's argument.

"No—I have four full years in which to complete the contract," the contractor maintained, and the Delaware courts ruled in his favor.

A Costly Mistake

A MISSISSIPPI builder ordered building material f. o. b. an Iowa point, and the seller was to pay the freight. Through an error, however, the seller failed to deduct the freight from the invoice, assigned the invoice to a bank, and the builder paid the bank the full amount of the invoice, before discovering the mistake. When the mistake was discovered the bank has paid over the money received to the seller.

"Money paid by a mistake of fact, although such mistake may have been caused by the payer's negligence, may be recovered from the party to whom it was paid," the builder contended, and sued the bank for the overpayment in the Mississippi courts.

"We admit that, as a general proposition, but it is also true that such money can be recovered only when the party receiving the money would be in the same position after he refunds it as he would have been in had the payment not been made," the bank contended, "and we would not be in that position, as we have already paid over the money."

"The bank was under a duty to pay the money received from the seller, and, having discharged that duty, the loss must be borne by the buyer, through whose mistake it was caused," said the Mississippi Supreme Court, in ruling in favor of the bank.

"HE'S over filing a saw," is a remark many a foreman would be glad to see eliminated from current excuses of carpenters. Besides the time actually used in saw filing much is wasted in other ways with it given as the reason.

The problem is now being met by having all filing done by an automatic machine, which does it quickly and with a perfection no human can achieve. A survey of hand versus machine filing methods used by Sharp Construction Company, Reading, Pa., conducted by Nielsen Surveys, throws light on this subject. Excerpts are as follows:

"The Sharp Construction Company, operating as building contractors and realty developers, has been using an automatic saw filer on the firm's own saws and those of its workmen since March of 1929. The results have been excellent as to workmanship, and large savings in both sawing time and sharpening costs are being made.

"Saws are picked up from the jobs by a light truck which is used for general utility purposes, brought to the shop and returned to the job the next day. Carpenters are encouraged to own two sets of saws—two rip and two cross-cut or at least one rip and two cross-cut—in order to facilitate handling. All sharpening is done by the shop mechanic.

"The first conditioning of an old saw is the hardest since continued filing by hand without proper jointing and in many cases with poor sharpening often results in teeth being broken out or worn down, so that possibly 25 per cent of the teeth are not effective in cutting. After the first conditioning a cross-cut saw is set up and filed in from 12 to 15 minutes, and sometimes in less time. Rip saws may require 30 to 55 minutes the first time and about 10 minutes thereafter if in reasonably good condition. Not many circular saws are used but these are easily handled. A 14-inch saw with 4 points to the inch that came in bad condition was set up and filed in an

MACHINE FILING

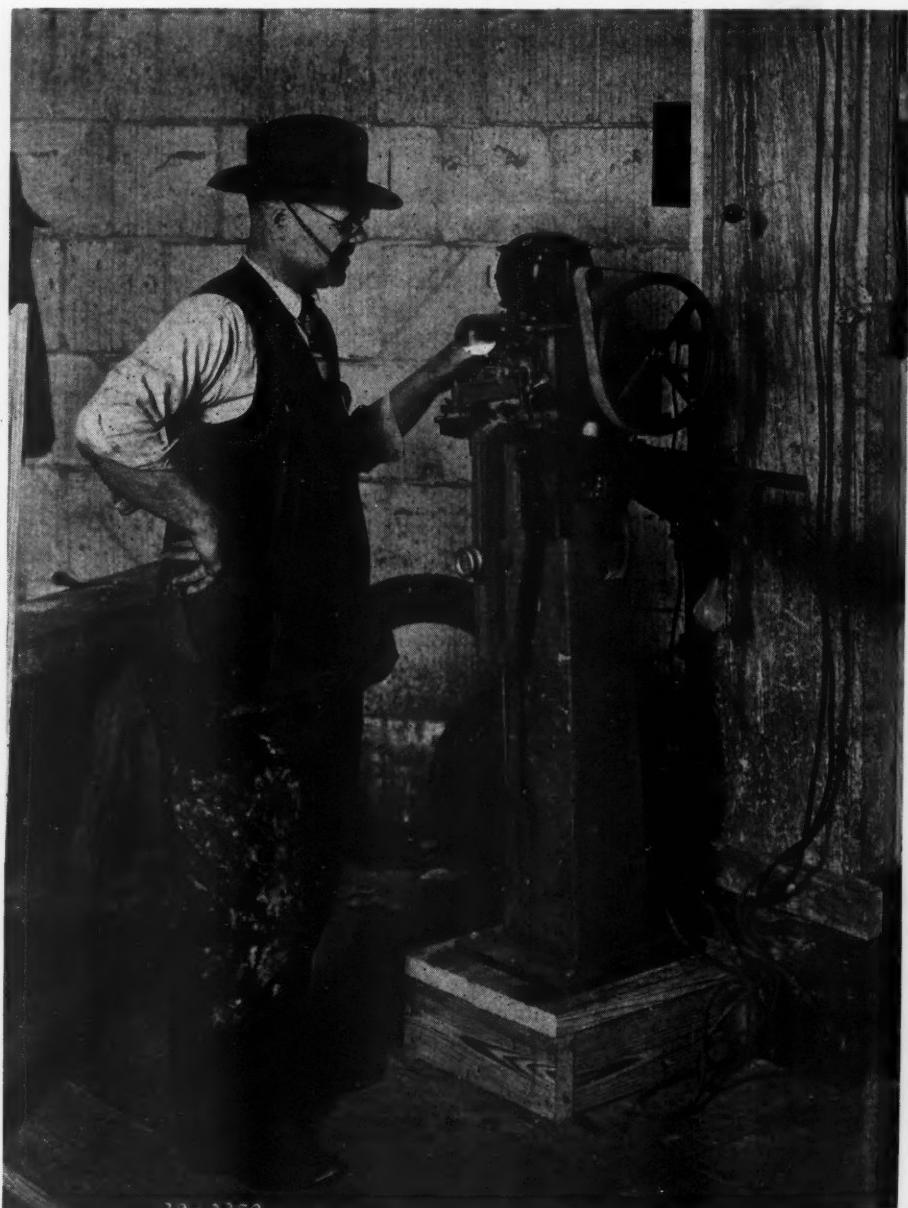
Contractors Find New Ways

hour but later sharpenings required 30 minutes or less. An average of only one circular saw comes in in two weeks.

"Saws are good for varying lengths of time after being filed, depending on the job, the kind of lumber and the care used by the workman. A saw may run from a few days to two weeks in steady service.

"Pitch of teeth in saws commonly used vary as follows: rip— $5\frac{1}{2}$ to 7 teeth per inch; cross-cut—7 to 11 per inch; mitre—10 to 18 per inch; circular—average 3 per inch. Due to the flexibility of machine, all types are equally well filed.

"Use of the filing machine has resulted in the company's men using uniformly sharp saws with definite results gained in sawing time. In addition to the reduction of time and cost for sharpening, the saws are 25 per cent more efficient in cutting, and by giving better and quicker cuts, save an average of from 20 to 30 minutes per man per day. This, too, will vary with the man, job, and lumber, and while it may be less in some



Special Shop for Saw Filing with Labor Saving Equipment and Two Experts in Charge Saved Money on the Merchandise Mart Job.

SAVES MONEY

To Cut Production Costs

cases it will frequently be much more in some others.

"Formerly carpenters did their own filing. This entailed a loss of time depending on the man. One man might do a first-class job in 30 minutes and another spend an hour and do an inferior job. Good saw filing requires a skill which few carpenters have. The average time lost per filing was not less than 30 minutes and with an ordinary schedule of work a carpenter would sharpen a cross-cut saw twice a week and a rip saw once. The loss in time would average about an hour and a half.

"One of the main difficulties with the hand filing was that proper jointing was not obtained, with consequent loss in cutting efficiency due to only part of the teeth working, and in extra effort necessary in order to do good work.

"Another factor which gives greater economy is the decrease in the number of filing jobs per man due to the fact that properly set and filed saws hold their edge longer because all the teeth are effective in cutting.



Kaufmann & Sons

Where the Carpenters' Saws on Chicago's Merchandise Mart Were Filed.
John Griffiths & Son Co., Contractors

WHY MACHINE PAYS*

Fixed Charges on Filer	
Depreciation—\$200.00 ÷ 10-yr. life.....	\$ 20.00
Average interest @ 6%—11/10 × \$200 × .06/2.....	6.60
Allowance for repairs and maintenance.....	5.00
 Total—per year of 200 days' use.....	\$ 31.60
—per day16
Daily Costs (for present average of 10 saws)	
Fixed charge	\$.16
Labor—2½ hr. @ \$1.25.....	3.13
Power—estimated (¼-hp. motor).....	.01
Files—\$.16 ea. ÷ 4.5 saws × 10 saws.....	.36
 Total—per day	\$ 3.66
—per saw366
Daily Costs (probable future schedule of 32 a day)	
Fixed charge	\$.16
Labor—8 hr. @ \$1.25.....	10.00
Power—approximately04
Files—\$.16 ea. ÷ 4.5 × 32.....	1.14
 Total—per day	\$ 11.34
—per saw355
Savings Over Use of Hand-Filed Saws	
Former filing cost—labor only—½ hr. @ \$1.00.....	\$.50
Present cost with machine at 10/day.....	.366
 Direct saving per saw—by difference.....	\$.134
Annual savings—in filing—6570 @ \$.134.....	\$ 880.38
—in labor—½ hr. × 12,045 hr. @ \$1.00.....	4,015.00
 —total gross saving.....	\$4,895.38
—less trucking cost 40 hr. @ \$2.50.....	100.00
 Net saving—per year.....	\$4,795.38
First cost of machine returned 24 times.	

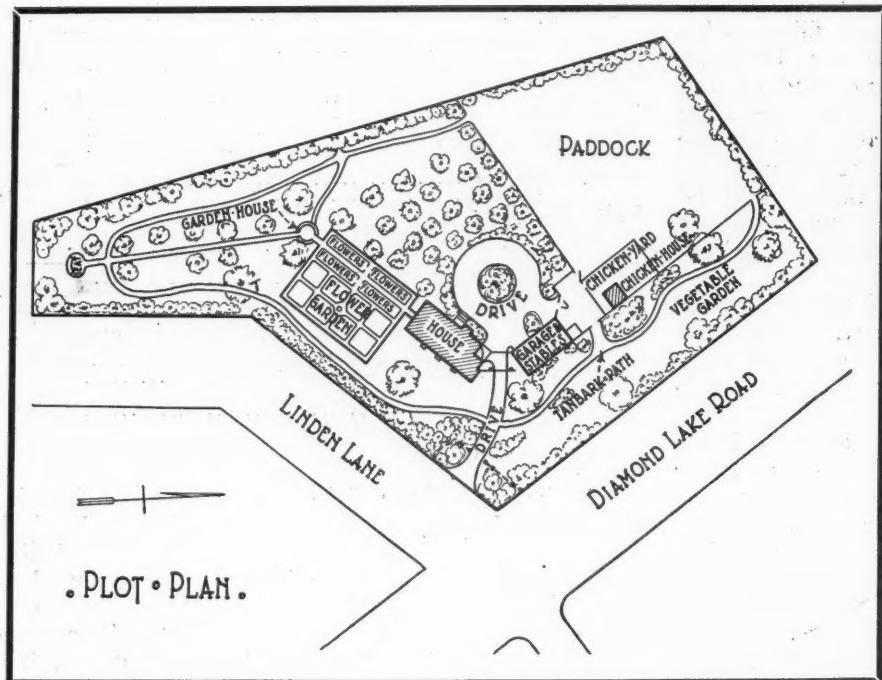
*Certified by A. C. Nielsen Co.

"In the table above, daily costs are shown first for an average daily use of 2½ hours and 10 saws handled, with items of labor, power and files. The latter item may be reduced in time when the saws are all thoroughly gone over but at present the average life of a file is four to five saws. The total cost, for the day is shown as \$3.66 or \$.366 per saw.

"When work is more active a heavier schedule will be necessary and 8-hour operation on 32 saws would about care for the estimated requirements. Costs are shown on that basis to be \$11.34 a day or \$.355 per saw. Former cost for labor only was one-half hour at \$1.00 an hour or \$.50. Using the higher figure for machine filing cost, the saving per saw was \$.134. (Continued on page 100)

Thousands Are Seeking

A Home in the Country



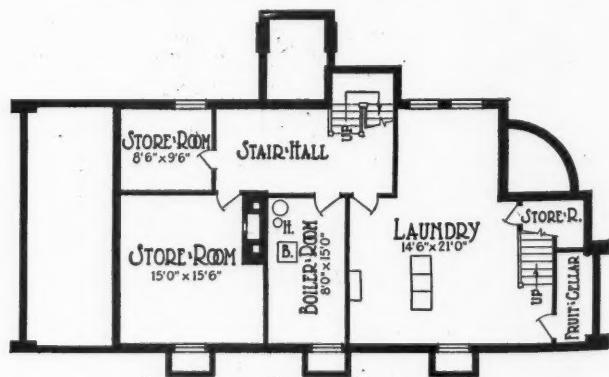
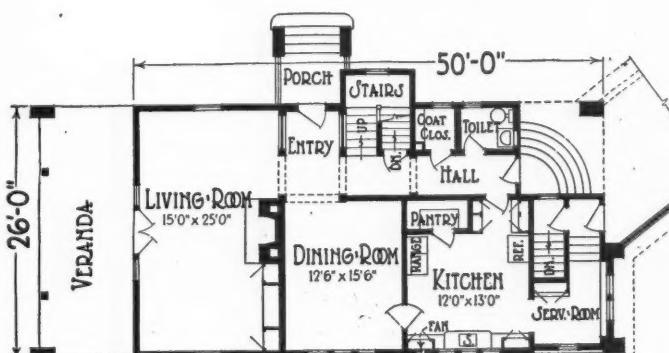
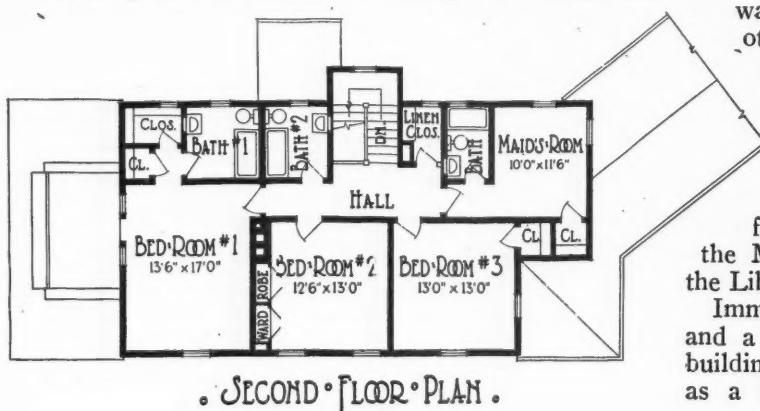
**Opportunities Beckon
Outside the
City Limits**

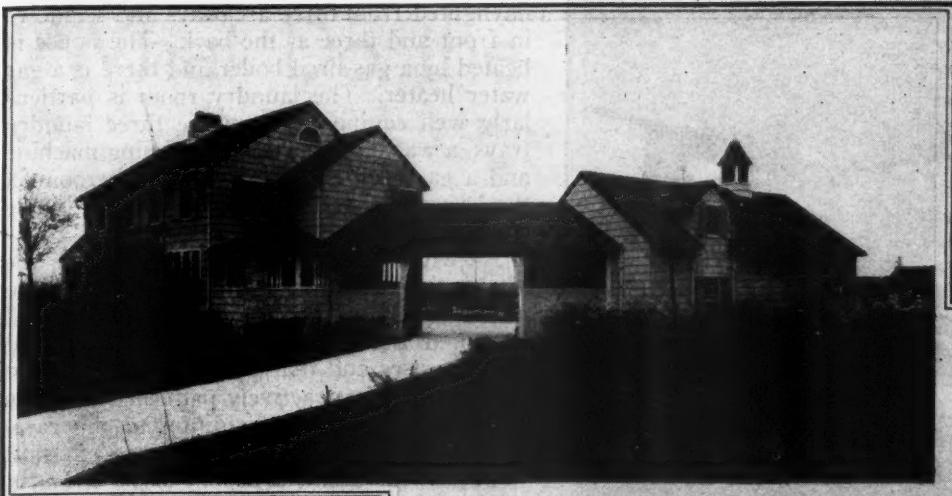
CITY dwellers often tire of congestion, the noise of traffic and dirt of a smoke-polluted atmosphere and turn their eyes with longing towards the green fields, the trees, flowers and crystal-clear air of the countryside. Many of them have been raised in the country and remember with delight the scenes of

their childhood. But they also remember the hardships—the eternal chores—carrying water, chopping wood and other drudgery, to say nothing of the once-a-week bath in the family washtub.

Luckily, those days are gone forever and modern farm families in many localities have fully equipped water systems, bath rooms, electric light plants and other conveniences. Just beyond the environs of a great city, it is comparatively easy to secure service from modern public utility companies, including gas and electricity, so the Public Service Company of Northern Illinois sponsored this modern "Home in the Country," near Mundelein, Illinois, less than an hour's ride from downtown Chicago, and it was financed by the Metropolitan District Realty Trust and built by the Libertyville Construction Company.

Immediately following its completion, for two months and a half—from July 12th to September 28th—the buildings on this 2½-acre estate were open to visitors as a demonstration home and hundreds of visitors





Street View and Garden View of the Public Service Company's Model Country Place Near Mundelein, Ill.



took advantage of the opportunity to inspect them and also the beautifully landscaped grounds.

While not built on the most sumptuous scale, this home, nevertheless, was built for a family of means, as the sale price was in the neighborhood of \$50,000. Plans, landscaping and electric wiring diagrams were prepared under the supervision of H. Von Holst, architect, of Chicago. The electric wiring was in accordance with "Red Seal" specifications and the home was equipped with every electrical convenience for the most modern style of living comfort, including an electric range with automatic temperature controls, an electric refrigerator, electric dishwasher, ventilating fan, percolator, toaster and clock in the kitchen and gas-fired heating boiler, clothes dryer, mangle and electric washing machine in the basement laundry.

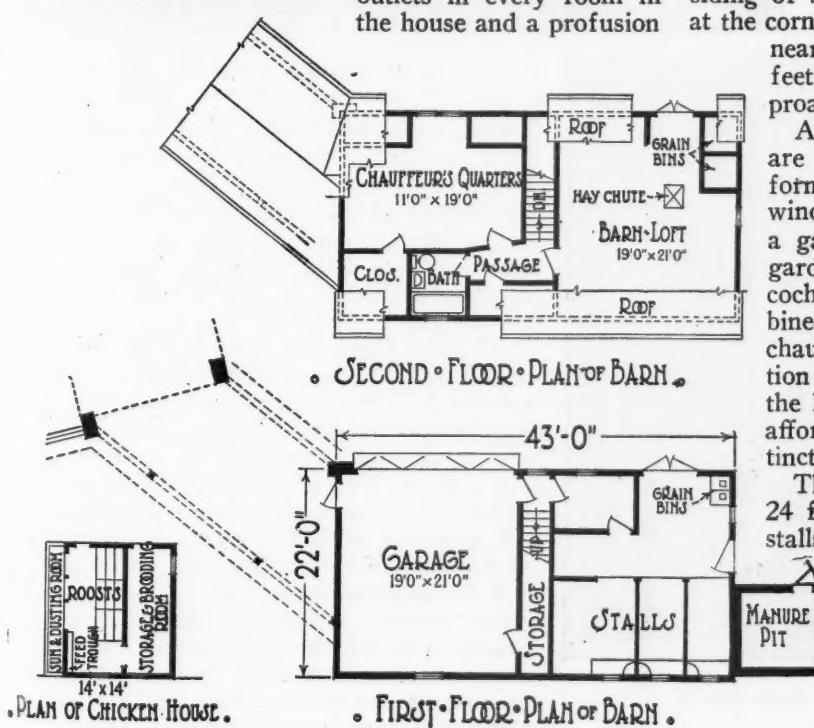
There are an adequate number of convenience outlets in every room in the house and a profusion

of lighting fixtures, including ceiling units, wall brackets, table and floor lamps. In the ceiling of the screened verandah, there is an ornamental lighting fixture of modernistic design and also outlets for table lamps. The living room has an extra large fireplace capable of burning logs, surmounted by a wood mantel, flanked by wood paneled walls with built-in bookcases.

The architecture of the house might be termed modified Colonial, with wood frame construction having siding of stained wood shingles. The house is located at the corner of Linden Lane and Diamond Lake Road, near Mundelein, Illinois, and sits back some sixty feet from the highway with a concrete drive approaching from the intersection.

As will be seen from the plot plan, the grounds are attractively laid out with shrubbery, trees, a formal flower garden and a tan-bark riding path winding through the grounds, also foot paths and a garden house overlooking the formal flower garden. The driveway enters under a porte cochere, the roof of which connects with a combined barn and garage building, containing chauffeur's quarters on the second floor, in addition to the barn loft. The porte cochere connects the house, barn and garage in such a way as to afford access through a covered passage—a distinct contribution to comfort in stormy weather.

The garage portion is liberal in size, roughly 24 feet by 26 feet, and the barn contains three stalls, a saddling up area, a harness room and grain bins. Directly back of the barn is a poultry house, with roosts for about 25 hens, at the rear of which there is a brooding room and storage. In the rear of the chicken house and behind the orchard, there is a paddock for the horses.





The Country Home Dining Room.

At the south end of the house, there is a completely screened verandah overlooking the beauties of green sward, shrubbery, trees and flowers. This verandah is off the living room. One enters the house from a porch facing the circular drive at the back. The stable and garage doors also face upon this drive which circles around a central island of flowers and shrubbery. As will be noted from the photograph, this island is a mass of blooms and there are evergreens and shrubbery flanking the drive.

The entry hall has arched openings on three sides; one leading straight ahead into the dining room; one to the right into the living room and, to the left, a stairway leading to the upper floor and a door opening on the basement stairs. The basement contains a large laundry room, three store rooms, an enclosed boiler room and a fruit cellar. It is

daylighted from three areaways and windows in front and three at the back. The house is heated by a gas-fired boiler and there is a gas water heater. The laundry room is particularly well equipped; there are three laundry trays, a washing machine, an ironing machine and a gas-fired clothes dryer. Each room in the basement has its separate lighting fixture and switch.

As will be seen from our illustration, the kitchen is particularly attractive. In addition to the equipment already described, it should be noted that there are several convenient kitchen cases and that the floor covering is a good grade of attractively patterned linoleum in cheerful color. In addition to the cases which flank the porcelain sink on each side, there are cases and a broom closet near the refrigerator.

Besides the maid's room and bath, there are three bedrooms and two baths on the upper floor, together with ample clothes closet space,



The Modern Farm Kitchen.



The Basement Laundry—Typical of this Farm Home with all City Conveniences.

a linen closet and clothes chute to the basement laundry. The main bedroom is extra large, 17 feet by 13 feet 6 inches. There are five duplex receptacle outlets in this bedroom and a central ceiling light, making ample allowance for table lamps, as well as other connections. Two of the bathrooms have electric heater outlets.

There is a growing tendency for the well-to-do to build homes with the latest comfort conveniences on country estates in the open country surrounding our large cities—a trend which has been stressed by the ease of modern motor travel over our many paved highways. Frequently, these country estates are scattered around a fine golf course and clubhouse which becomes social headquarters for the neighborhood. The art of the landscape architect transforms these estates into beauty spots which are becoming features of many rural communities. It is a wholesome trend and one which offers builders opportunities to develop some quality business.

What Do the Specifications Mean?

Puzzling Points Made Plain

A GOOD deal of head scratching on the job is due to ambiguous wording in specifications.

On large local jobs where the architect or his specification writer can be easily reached by 'phone or visit little trouble will result, as the matter can be readily explained.

Where the job is out of town the builder must necessarily go ahead; and, if his men err in the interpretation of the specifications, the work may have to be done over again with the consequent argument regarding who is to pay for "the extra."

It is well to read specifications very carefully before bidding and have all double meaning phrases made clear.

To show what certain specification wording means the following excerpts are given with an illustration showing how the work specified should be carried out.

Some of this may seem elementary but it is with these small items that most errors occur.

Flashings

All intersections of roofs with vertical surfaces of every nature shall be flashed and counterflashed.

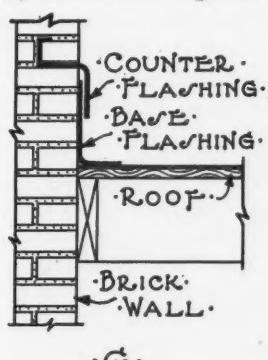
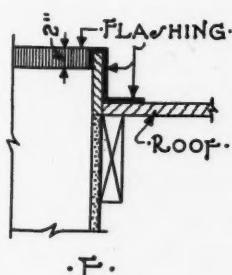
Flashings around all skylights shall extend up the full height of the curb, and turn two (2") inches over top of curb. (see F)

Where metal base flashings are specified they shall be installed in accordance with the following requirements for the various types of roofs.

Base flashings shall extend out onto the roof, over the felt, a full four (4") inches, be securely nailed at not less than four (4") inches centers at outer edge, extend up onto vertical surfaces at least eight (8") inches above the finished roof surfaces and be left free. (see G)

Base step flashings shall be laid with every course of roofing material, extend four (4") inches out onto roof, lap one another four (4") inches and extend up onto vertical surfaces a full three (3") inches under counter flashing; the minimum height to be six (6") inches above finished roof.

Base flashings at door and low window sill adjacent to roofing shall extend vertically to bottom edge of sill,



inward to form a pan under the sill and be formed with head at ends, and turned up at back of sill.

Base flashings shall be full length pieces and, except on sloping roofs, shall be locked and soldered. Where base flashing occurs in connection with metal roofs, the flashing shall be locked and soldered to roofing sheets. On sloping shingle, slate or tile roofs the flashing sheets shall lap at least four (4") inches.

Counter flashings generally shall be turned into the first joint above the high point of base flashing and, except for parapet walls, carried in for the depth of one brick, turned up one brick course and then carried through to the inside face of the wall turned up one (1") inch. On parapet walls the flashing shall extend through to within one (1") inch of outside finished face, and formed up and down over a course of brick in the center of wall.

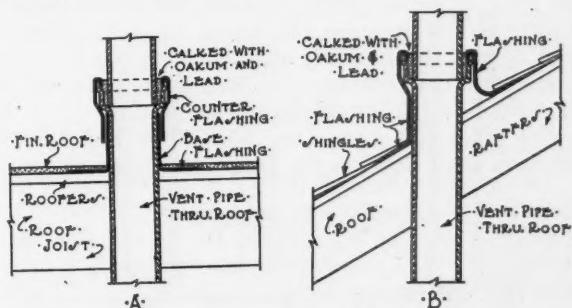
Where counter flashings are required, at approximately the same level on two sides of a firewall, the flashings shall be carried through the wall from each side, at least one brick course apart, overlap horizontally four (4") inches and turn up the height of one (1") inch.

Where counter flashing occurs on a sloping surface against stone or terra cotta the sheets shall have an $\frac{1}{8}$ " or $\frac{1}{4}$ " bend on the edge, be turned into reglets, not less than one (1") inch and be caulked with lead wool.

Where flashing is let down into horizontal surfaces of stone or terra cotta an edge shall be turned as above specified and the reglet filled with an approved caulking compound.

Counter flashings shall extend down over base flashings at least three (3") inches and lapped six (6") inches.

Counter flashings on sloping roofs shall be stepped. They shall be built and soldered together in suitable lengths and set as complete units. Unless otherwise specified flashings shall extend completely through the wall, except on chimneys where they shall turn up two (2") inches against the flues.



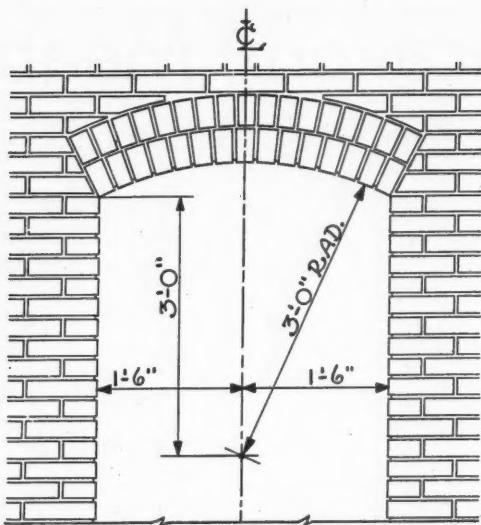
Vent or Other Piping

Where vent or other piping passes through flat roofs they shall be flashed and counter flashed. The base flashing shall extend at least four (4") inches onto the roof and turn up against pipes not less than eight (8") inches. The counter flashing will be caulked into hubs of pipes as shown at (A) or embedded in white lead and held with brass clamps; or, for threaded pipe, will be covered one (1") inch by plumber's reamed out coupling.

Where vent or other piping passes through sloping roofs the base flashing shall extend laterally, out onto the roof surface sufficiently to insure water tightness. Vertically, the base flashing shall extend eight (8") inches above the finished roof surface (as shown at B).

Arches

Arches of common brick will be required over all openings in common brickwork, except where steel or



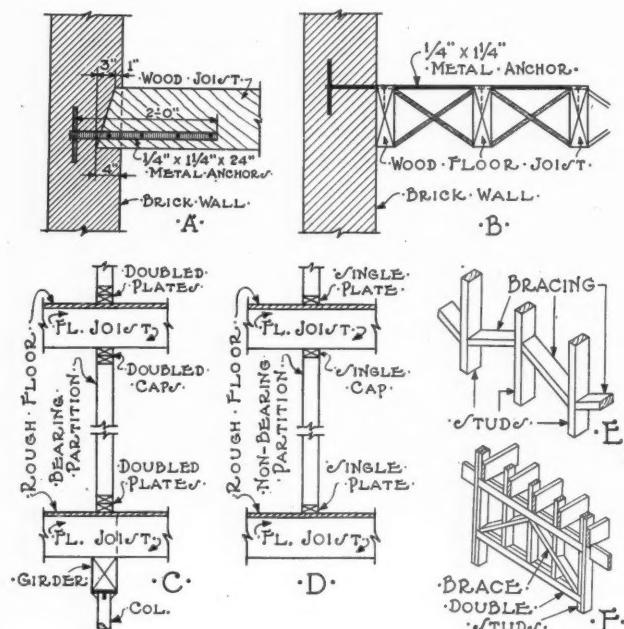
reinforced concrete lintels are called for. All such arches shall be rowlocked arches, segmental in form. Generally, one rowlock will be required for each twenty (20") inches in width of opening or fraction thereof. Radius of arches shall be equal to the width of the opening. The drawing shows a three (3') feet wide arch made to this specification. As the span is more than twenty (20") inches and less than forty (40") inches, two (2) rowlock lock arches are required.

Framing

Joists, beams, girders and rafters shall be set with their crowning edge upwards and, where bearing on masonry walls, shall be splayed not less than three (3") inches in their depth, with bearings of not less than four (4") inches.

Each tier of joists bearing on walls shall be tied to masonry walls at intervals not exceeding four (4') feet by metal anchors not less than $\frac{1}{4}$ of an inch by $1\frac{1}{4}$ inch across section and at least twenty-four (24") inches long securely spiked near the bottom of the joists and provided with split and upset ends or other approved means for building into masonry (see A).

Joists parallel to masonry walls shall be provided with similar anchors at intervals not exceeding (6') feet, engaging three (3) joists (see B). Upset and "T" ends on anchors shall develop the full strength of the anchor strap.



Framing in all cases shall be kept at least two (2") inches clear of all fireplace breasts, hearths, chimneys and flues.

Where studding, forming bearing partitions or walls, occurs over sills, girders or plates, they shall extend down to these and be securely spiked to bearings and, where possible, to the floor joists as well.

Joists carrying parallel bearing partitions shall be doubled under them. Bearing partitions at right angles to joists shall rest on doubled plates (see C). Non-bearing partitions may rest on single plates, laid over subfloors (see D).

All stud bearing partitions and walls shall have doubled caps and cross bridging of same material as studs, at intervals not exceeding six (6') feet in height securely nailed with at least two nails at each end (see E).

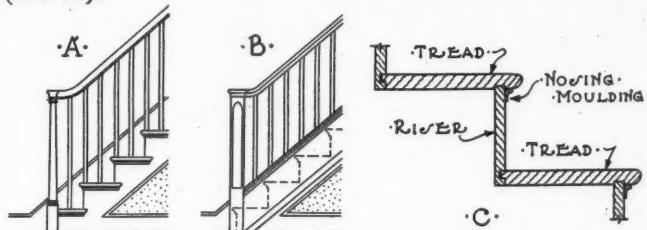
In general, studs shall be doubled at all corners and angles, and sides, and heads of openings. Truss over all openings wider than three (3') feet, and over openings in bearing partitions (see F).

Where framing out is necessary, both header and tail beams shall be supported with approved wrought iron joist hangers or stirrups. Where more than two joists frame into a header, both trimmers and headers shall be doubled in size.

Stairs

Stairs shall be constructed with open or closed strings as noted on plans or in specifications.

Where open string construction is called for, rough carriages shall be provided consisting of material specified for general floor framing not less than two (2") inches thick and spaced not more than 2 feet center to center in the width of the stair. These carriages shall be accurately cut to the rise and tread required for the stair and securely and rigidly fixed in place ready to receive finished strings, treads and risers (see A).



Finished strings, treads and risers shall be of material specified for interior trim. Where closed strings are specified or shown on drawings, they shall be dadoed to receive treads and risers. Where an open outside string is specified or shown, the string shall be scribed to underside of treads, and be accurately mitred to the risers (see B).

Where open strings are called for, the treads shall be firmly secured to carriages, have nosing formed as indicated on details, returned on outside string, mortised for balusters, grooved on under side at the front to receive tread and finished with moulding as indicated (see C).

Where closed string construction is called for, the treads and risers shall be housed into the strings and tightly wedged and glued. The risers shall be tongued into tread above and grooved to receive tread below. Outside strings shall be panelled or plain as shown on drawings, finished on top with a moulded shoe prepared to receive balusters and with scribed or soffit mould as required. The wall string shall be finished on top with a scribed mould or arranged to form base for panelling as indicated (see A).

Practical Job Pointers

Pipe Hauling Simplified

In hauling large, heavy pipe, of concrete, metal or other material, by truck, the method shown in the illustration will be found most convenient both for quick loading and for securing the pipe in place on the truck, so that it can not roll to either side.

A special frame, consisting of two long sections of 4-inch pipe, slipped through holes in two 8-inch I-beams, one near each end of the chassis, is securely bolted to the chassis. A large loop of $\frac{3}{4}$ -inch steel rod is secured by bolting, riveting, or welding, to each of the I-beams at the middle. To each of these, 2-inch I-bolts are secured by short chains.



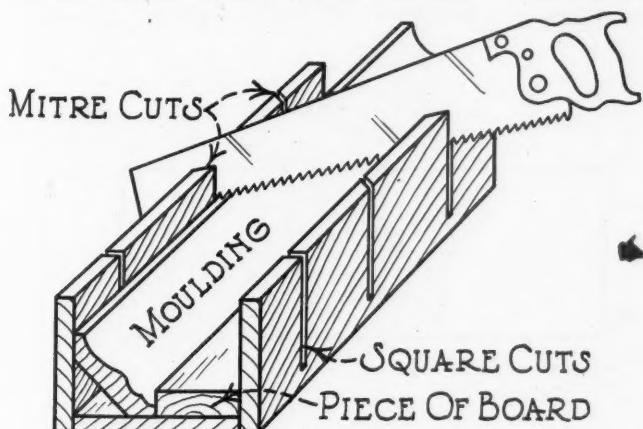
A Frame Attached to the Truck Chassis for Hauling Heavy Pipe.

The two I-bolts fit into holes at each end of two wedge-shaped blocks, the length of the chassis, made of 6 by 6, or 8 by 8 timbers, and are tightened with a threaded clamp. The block on one side is secured in place by these clamps, the pipe that is to be transported is rolled onto the chassis, and the other block is then inserted and tightened. It is only a moment's work to place or remove this block.

JOSEPH C. COYLE, 538 Santa Fe Drive, Denver, Colo.

Use a Wide Mitre Box

In the January issue, Joseph J. Zar recommended a narrow mitre box for cutting spring moulding. I have found,



A Piece of Board Placed in the Wide Mitre Box Holds the Moulding for Cutting.

A Reader's Exchange of Tested Ideas and Methods, Taken from Their Own Building Experience. Two Dollars Will Be Paid for Each Contribution Published in This Department.

however, that a wide mitre box works more accurately than a narrow one and, besides, will last longer.

When cutting spring moulding in a wide mitre box, I usually fill the extra space on the bottom of the box with a loose piece of board, wide enough to hold the moulding tight. This holds the moulding as well as a narrow box would. Besides having the other advantages mentioned and can also be used for other work.

WERNER KRAATZ, 28 Lake St., White Plains, N. Y.

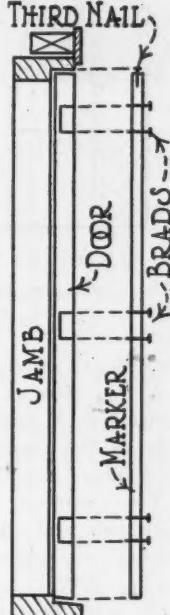
For Marking Door Butts

THE sketch shows a marker for butts to be used when hanging heavy doors, such as garage doors. It makes the work easy and is accurate, no matter how many butts are used on a door. With it one carpenter can do the work alone.

First take a light stick, equal in length to the height of the door. Mark the desired location of the butts on this stick and through each mark drive a brad, letting the points of the brads project about $\frac{1}{8}$ inch.

On the top end of the stick drive a three penny wire nail, letting it project about $\frac{1}{16}$ inch, or a distance equal to the desired clearance at the top of the door. When you are ready to mark the butts, place the top of the stick flush with the top edge of the door and tap the brads lightly so each brad makes a light mark on the door. Next place the stick against the jamb with the head of the three penny nail resting against the top edge of the jamb. Again tap the brads lightly marking the jamb.

ROMEO LAROSE, 8 Osborne St., Rochester, N. Y.



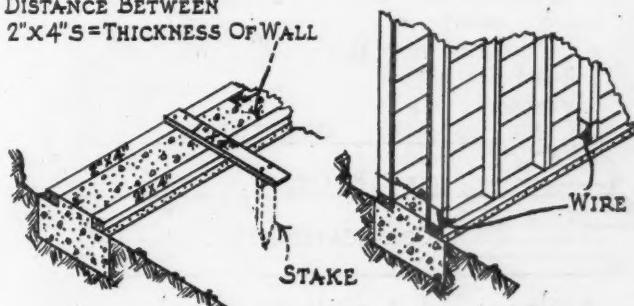
With Such a Stick One Man Can Mark Doors and Jambs for Butts Accurately.

Footings Simplify Form Work

THE method of construction illustrated in the sketch saves a lot of labor, I find, and should be interesting to many others. By using a form like the one shown, when the footing of a foundation wall are put in, the work of erecting the foundation forms is made easier. This keeps the bottom of the form perfect and eliminates the need of the usual wooden spreader and the lower brace. It is not necessary to make the footing perfectly level.

EUGENE T. MARTIN, 6 Harmon St., White Plains, N. Y.

DISTANCE BETWEEN
2"X4'S = THICKNESS OF WALL



Building Footings Like This Simplifies the Building of the Form for the Wall.

Nailing That Saves Saws

In order to avoid hitting a nail with the saw when cutting out plates for door or other openings, the toe-nailing should be done from the edge, instead of from the side as is usual. There are so many times when it becomes necessary to cut out a plate between studs that, if the nailing is from

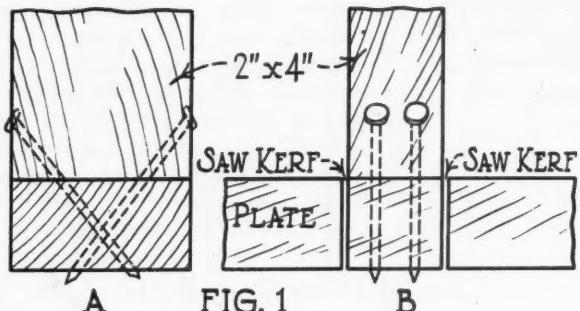


FIG. 1

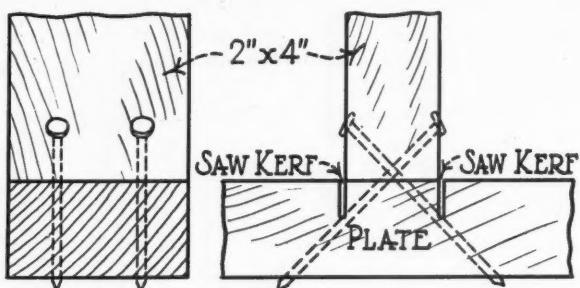


FIG. 2

Toe-nailing as in Figure 1, Saves Damage to Saws When Cutting the Plate.

the sides, a good saw is sure to be damaged sooner or later.

A side view of the toe-nailing from the edge is shown in figure 1 at A, and an edge view at B. The saw kerf on each side of the studs, through the plate is shown illustrating how there is no danger to the saw with this method.

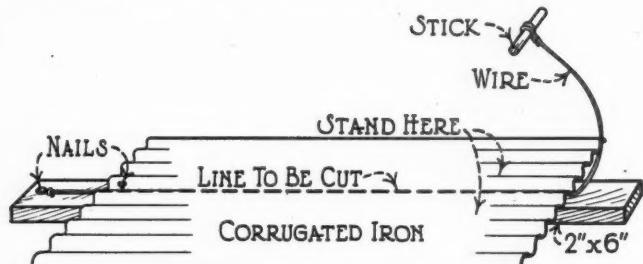
The common, side-nailing method is shown in figure 2, both side and edge views. In the edge view the saw kerf through the plate is shown to illustrate the point that it is not possible to saw through the plate without striking the nails, with this method of nailing. Striking the nail means refiling the saw and wasting a lot of time.

H. H. SIEGLE, Emporia, Kan.

Cutting Corrugated Iron

TO many, the cutting of corrugated iron along the grooves is still a problem. Some use the back of a saw, while others still hold to the tin snips. I have found a method which is an improvement over both of these.

First take a two by six, or heavier piece of lumber, that is longer than the iron to be cut. At one end of this board securely fasten the end of a piece of wire, which must also be longer than the iron to be cut. Wrap the free end of the wire around a small stick to serve as a grip.



A Simple, and Accurate Method of Cutting Corrugated Iron with a Wire.

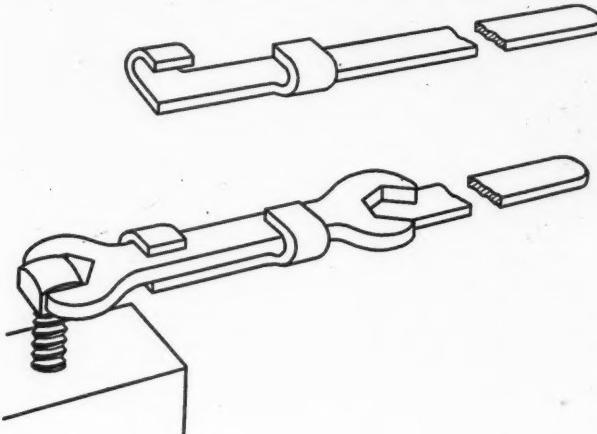
Straighten the wire out along the board and place the corrugated iron on the board, over the wire. With the iron in the proper position tack it to the board with one nail placed near the fixed end of the wire. Stand firmly on the other end of the iron and grasp the stick at the end of the wire in your hands. Pull steadily, without jerking, and as the wire cuts the iron step backward guiding the wire along the mark where the iron is to be cut. You will find the iron can be cut quickly and accurately by this method.

JACK BOYDSTUN, Natchitoches, La.

For Extra Leverage

OFTEN a little extra leverage is needed on a short, open end wrench in order to force a bolt or lag screw home, or to loosen it. To obtain this extra leverage an extension can be made, as shown in the sketch. This extension is made from strip or plate stock to fit the complete set of wrenches. A slight side movement will attach or detach it instantly.

CHAS. H. WILLEY, Box 73, Concord, N. H.

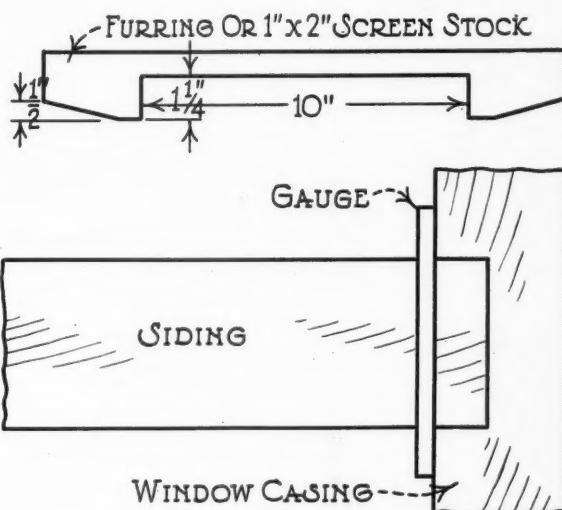


An Extension Handle On the Wrench Gives Much Greater Leverage

A Handy Siding Gauge

FIND a gauge, made as shown in the sketch, most convenient when applying 10-inch bungalow siding. The cuts on the ends allow the gauge to lie flat on the siding, as the siding is pitched, and the upper corner strikes the lining board.

STURE BENGTSON, 23 Adelle Circuit, Worcester, Mass.



A Gauge Cut in This Way Is Handy in Applying 10-Inch Bungalow Siding.

Better Buildings—Lower Costs

Are Achieved When Modern Equipment and Materials are Used in the Construction of Buildings.



It is a Simple Matter to Apply this Adjustable Frame to Any Ordinary Bathroom Cabinet to Provide Convenient, Adjustable Lighting of the Mirror.

"**A**LWAYS something new," seems to apply with particular force to the activities of those manufacturers who are engaged in producing building products. There are new materials which reduce the labor and cost of construction. There are new items of equipment that make the new buildings more desirable. And there are other products to be applied to old buildings to bring them up to date and increase their value.

Modernizing Bathroom Cabinets

Among the latter, for example, is a new device to improve the common variety of bathroom cabinet and make it up-to-date and more convenient. This device is put out by a company which manufactures bathroom cabinets of an improved type, with sliding lighting fixtures built into their frames to provide correct lighting from any angle. The new device converts the old style cabinet into this new style. The manufacturers furnish two side rails with light fix-

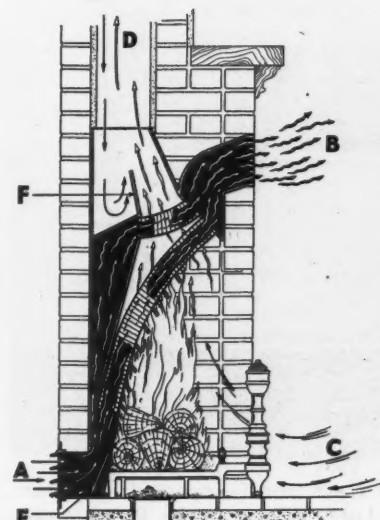
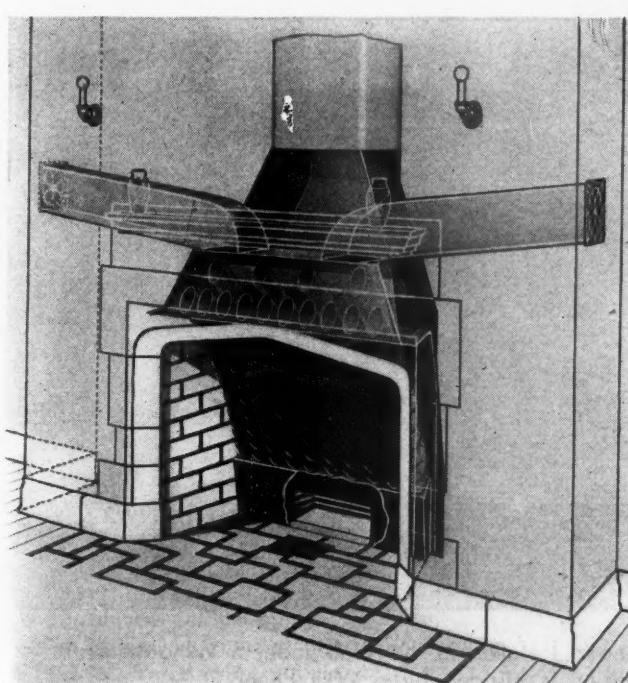
tures in slots, and a top rail which is adjustable to any width of cabinet. This set is wired ready to apply to the wall around the cabinet and framing it

Fireplaces for Ventilation

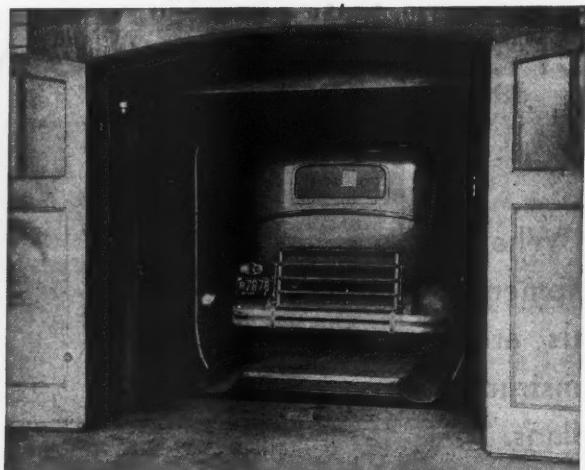
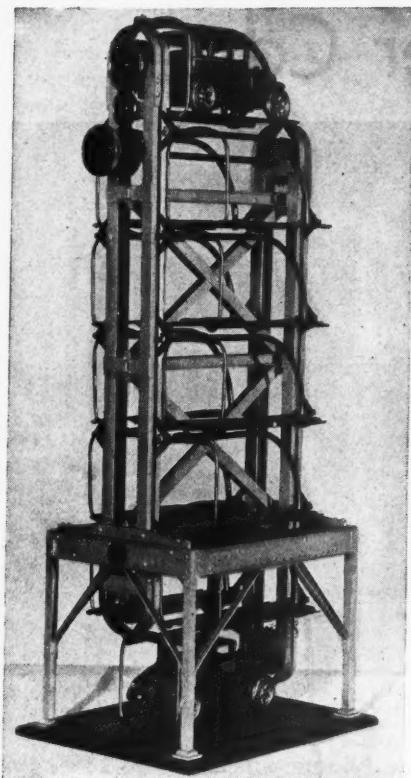
Another manufacturer has modernized the fireplace, that center of home life which has remained practically unchanged through two thousand years of use. A constant supply of fresh air is necessary to health in any home and the new type of fireplace meets this need in a novel and practical manner.

The new fireplace is built with an opening, or duct, at the back which leads to an opening in the outer wall of the house. Outside air is drawn into this opening by the action of the fire in the fireplace, and passes through a series of tubes in the fireplace, which are in contact with the hottest

The Fireplace Which Provides Warmed Fresh Air and Its Method of Circulation Through the Heating Tubes and into the Room are Illustrated Here.



For further information on any of the products mentioned on these pages write American Builder and Building Age, Information Exchange, 105 W. Adams St., Chicago.



At the Left: The Parking Machine with Cradles Supported on Two Endless Chains Operated by Electric Motors and Automatically Controlled.

At the Right: One of the Parking Cradles with a Car in Place.

part of the fire. It is then discharged into the room through register openings.

Now Comes Vertical Parking

It may be a long jump from fireplace to automobiles, but any-

how it should be interesting to note that, at last, the parking problem has been solved. Just push a button, turn a key, or deposit a coin when you wish to park and, in less than a minute, a parking place for your car presents itself. Upon your return, your parked car is delivered to you automatically.

Such convenience is now possible. An automatic vertical parking machine, which makes possible the parking for twenty-four automobiles on a ground space little larger than an ordinary double garage, has recently been perfected.

This machine consists of cradles, one for each car, supported between two endless chains which pass over sprocket

wheels at the top and bottom of travel. The chains are driven by electric motors and by means of one of the control methods mentioned, can be brought to the driveway level quickly for receiving or delivering the car.

Concealed Radiators of Cast Iron

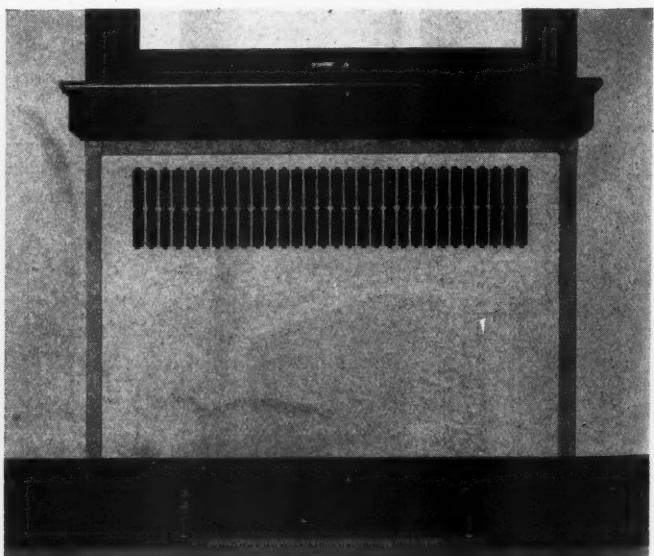
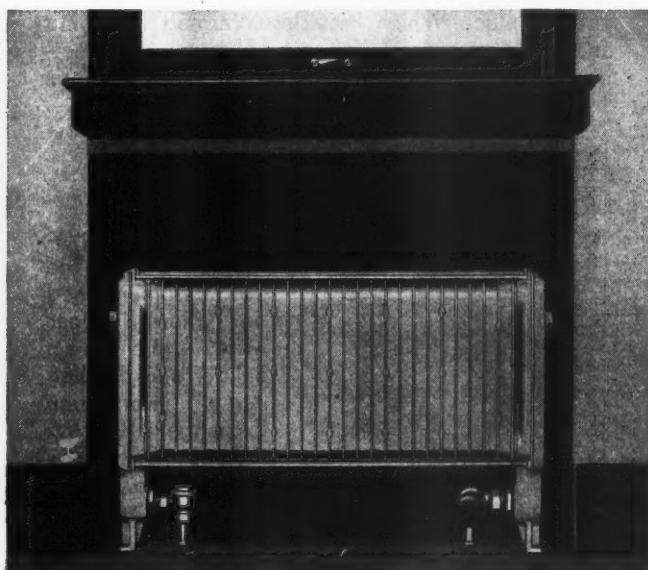
To return to equipment for the home, there has been much talk, of late years, about concealed radiation. The concealed radiator has come to stay, but up to date it has been built largely of copper. Now one of the old established manufacturers of radiators has perfected a cast iron radiator which is designed for complete concealment.

This new radiator is equally well adapted to hot water and steam systems and is designed to give efficient, and well balanced heating with thermostatic control. It is made in sizes sufficiently compact for installation in spaces as shallow as between two by four studding.

The new cast iron, concealed radiators have the same operating characteristics as this company's exposed radiators and the two types can be used in combination on one system, with thermostatic control, providing a well balanced system with uniform heating of the building.

Still More Concealed Radiation

While speaking of concealed radiation, another new prod-



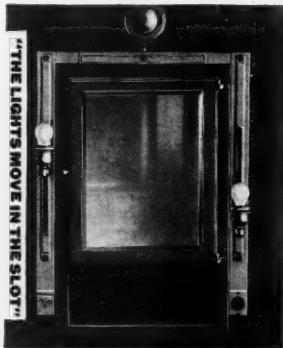
One of the New Cast Iron Concealed Radiators Is Shown Installed in the Wall under a Window, at the Left; While, at the Right, the Installation Is Hidden by a Wall Panel.

"THE LIGHTS MOVE IN THE SLOT"



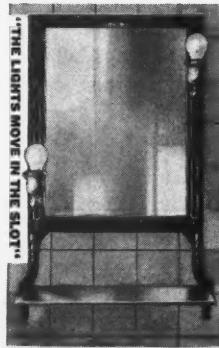
One of the fast selling "Edge-Lites" for homes, apartments, hotels. Wired, complete with cabinet, mirror, two sliding slot fixtures.

For apartments, hotels, second bathrooms, etc., where cabinet may not be wanted, this "Edge-Lite" Manor is attractively priced.



Extra Profit!

Wherever a cabinet is in and you cannot sell an "Edge-Lite", turn the old cabinet into an "Edge-Lite" with Aplakay! Aplakay is a silver lacquer frame of steel with sliding slot fixtures, all wired, adjustable to old cabinets! Selling by hundreds to homes, apartments, hotels! \$13.50, lower in quantities.



Installing the adjustable Aplakay around old cabinets is the job of a few minutes. Convenience electrical outlet included and receptacle for used razor blades.

Put EXTRA money in your pockets with "EDGE-LITE" Cabinets

ALL you have to do is show people the "Edge-Lite" or put it where people can see it, and it demonstrates and sells itself. The minute your prospects set eyes on the "Edge-Lite," they see its sliding slot light fixtures and want to try them—and that's the first big step toward a sale. Then, just point out that these two sliding fixtures save \$10.00—the cost of the two electrical outlets and fixtures usually placed alongside any bathroom cabinet—and the sale is practically made.

If you have a showroom, dress it up with this "shadowless-shaving 'Edge-Lite'." Tell women that it is a regular "movie-star's make-up mirror for the home." Show "Edge-Lites" to apartment and hotel operators—prove how it modernizes their rooms and holds guests and tenants. Do that, and you'll "clean up" on "Edge-Lites!"

Nationally Advertised

National full-page advertising in House and Garden, House Beautiful, Hotel World, etc., is bringing the "Edge-Lite" message to hundreds of prospects in your area. Be ready! Get summer discounts and full-color catalog now! Henkel Edge-Lite Corporation, 904 No. Franklin St., Chicago. New York Office and Showroom, 19 West 44th St. In Canada, Henkel Edge-Lite, Ltd., Architects' Bldg., Montreal, Quebec.

HENKEL "EDGE-LITE" CABINETS ♦ MIRRORS ♦ APLAKAY

PASSED BY FIRE UNDERWRITERS, TRADE-MARK REG. U.S. & CAN.; PATS. & PAT. PEND. U.S., CAN. & FOREIGN
A-4658

uct, offered by well known makers of heating equipment, can not be overlooked. High efficiency is obtained by means of the fin construction. The outer edges of the fins are formed to a right angle so that each fin is in contact with the next, producing a flue effect. The inside edges are also flanged to provide greater contact between fins and tubes, and extra heavy, twenty gauge galvanized fins provide high conductivity.

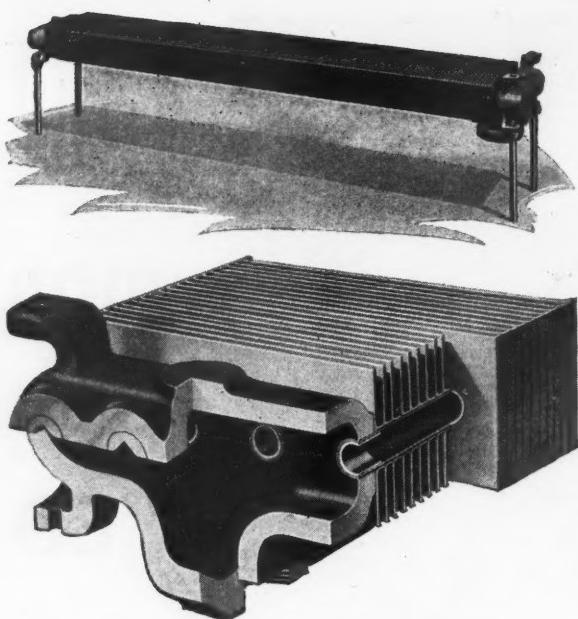
The copper tubes are fitted into extra heavy, cast iron headers by a special process which makes it impossible for them to loosen. A tie rod connecting the headers adds strength, as does also the flue construction of the fins. The fins are of Armco ingot iron.

Built-in Steel Laundry Hampers

Just as the concealed radiator adds to the attractiveness and space of the home by harmonizing with the decorations, and retiring into the wall, so does the built-in laundry hamper meet the same demand. It is suitable for either bathroom or kitchen installation.

Made of sturdy furniture steel, with smooth rounded corners, these hampers are easy to keep clean and there is no danger of catching and damaging even the daintiest fabrics. They are well ventilated to prevent mildewing and the clothes are easily removed because the entire front is detachable.

Laundry hampers of this sort are finished in a variety of colors to fit any color scheme and the fittings are all chromium plated.



Illustrating the Construction of a Newly Perfected Efficient and Sturdy Type of Concealed Radiator.

subdued by a protective and diffusing screen and louvres.

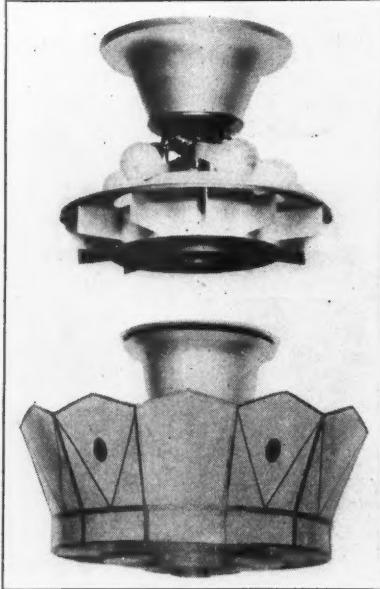
Electric Refrigeration Improved

One criticism of electric refrigeration has been the dehydration of food, with consequent loss of flavor where temperatures were kept low for freezing ice cubes and desserts. Now comes an electric refrigeration which, according to its manufacturer, does away with dehydration.

This is accomplished by means of two refrigerating units in one. There is a low temperature coil directly underneath each ice tray, which is thermostatically adjusted to freeze water and desserts. There is also a large fin unit above the ice trays which is thermostatically adjusted to cool the entire storage compartment.



Built-in Steel Laundry Hampers Help to Modernize the Bathroom or Kitchen.



Two Purpose Lighting Fixture with Its Construction Shown Above.



A Double Cooling Unit Provides Suitable Temperatures without Dehydration.

Lighting with a Double Purpose

With beautiful interior finishes and equipment, good lighting and handsome lighting fixtures are also necessary to put the finishing touches to a home. The same is true of the modern office and when, to these, is added ultra-violet lighting, available at a touch, for health purposes, the last word in lighting equipment seems to have been reached.

Such lighting equipment is now available and one of the new fixtures is illustrated here. It is equipped with two circuits, one of which is for the direct lighting ultra-violet ray radiation and employs one sunlight Mazda lamp.

The other circuit is for semi-indirect light component which employs six ordinary Mazda lamps and is designed for use over long periods of continued vision without glare, which is

The Largest Company-Owned Truck Service Organization in the World

MANY factors have contributed to the phenomenal rise of International Trucks but none has contributed more than the after-sale service. Service is a paramount issue today! What could be more important than adequate service facilities for hard-working, roughly-treated trucks that must carry on, economically, for many years? Fleet owners, confronted with new problems of cost-reduction, are asking themselves that question, and answering it by buying Internationals. They are investing in International Trucks and putting the entire servicing burden on the shoulders of International Harvester.

Some years ago International Harvester conceived an ideal of truck service the full import of which was far ahead of the industry—and then proceeded to build that ideal into a nation-wide

network of branches equipped to handle every possible service need and emergency. Today the largest, strongest, most effective Company-owned truck service organization in existence is at the call of International owners.



*Put your servicing problem and responsibility squarely and completely up to International Harvester. You cannot afford to maintain burdensome repair stocks, trained personnel, and costly modern equipment for repairs and overhauling. We cannot afford *not* to provide the very best of service everywhere. Your job is hauling. Our job is to provide quality trucks—and to keep them on the job.*

Let's maintain this logical and practical division of labor. We assure you great savings, great benefits. *We are equipped for mass-production of service and that means lowest possible costs every step of the way, as tens of thousands of International owners know to their lasting satisfaction.*

One of the 183 International Company-owned branches is near you. It is part of the Gibraltar of truck service—it is there to stay. Besides the branches there are International dealer-owned stations at many points, so that, wherever your trucks go, they stay in range of International service. See the full line of International Trucks, ranging from $\frac{3}{4}$ -ton to 5-ton, at any display room. Demonstration on request.

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. **OF AMERICA**
(INCORPORATED) Chicago, Illinois

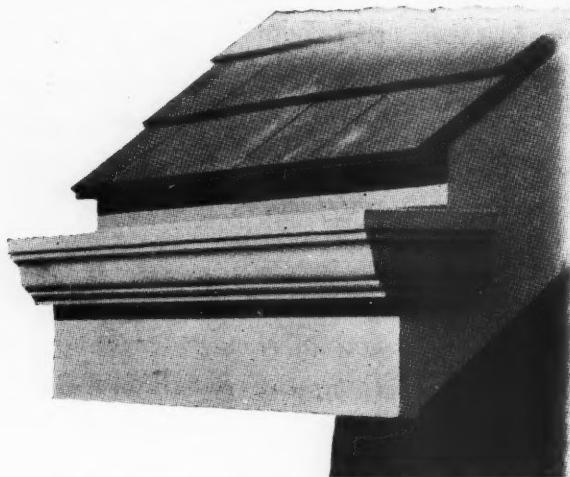
INTERNATIONAL TRUCKS



A Railroad Retaining Wall Before and After Being Repaired, with Pulverized Iron Used as a Bonding and Waterproofing Material, Shows the Perfect Results Obtained.

A Simple Concrete Waterproofer

Passing from the subject of beautiful and useful equipment to the more prosaic, though no less interesting, subject of building materials, we find that a simple and effective method of waterproofing concrete has been made available to the building interests. The material used is nothing more nor less than powdered iron.



This Newly Designed Fir Gutter Affords a Deep Shadow Line Which is Architecturally Effective.

The iron is pulverized, mixed with water and applied with a brush to the concrete. The water soaks into the concrete carrying with it the iron. The particles of iron rust, the action being hastened by chemicals. The oxidation or rusting of the iron causes expansion which completely seals the pores of the concrete and renders it waterproof. The coating of rust may then be covered with a trowelled on plaster coat or brushed on cement to restore the color. There is no tendency, thereafter, to either become discolored or to deteriorate.

The same material is used as a bonding material in repairing concrete and as a concrete floor hardener. It has been extensively used, on many large projects, for all these purposes, and has stood the test of actual service.

Attractive Wood Gutters

Both practically useful and architecturally effective is a new line of fir gutters which has been designed to give a

For further information on any of the products mentioned on these pages write American Builder and Building Age, Information Exchange, 105 W. Adams St., Chicago.



deep shadow line. The illustration shows the effective appearance of these gutters so far as it can be shown other than in an actual installation. It fails, however, to carry the complete impression of harmony that is afforded by their use on frame houses.

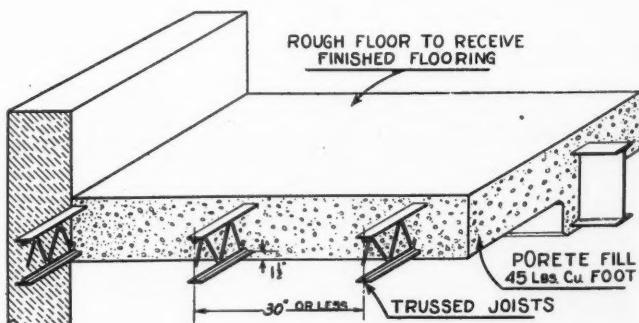
The makers of these gutters also supply leak-proof fittings for joints, mitres, and ends; and the gutters themselves are furnished sufficiently dry for immediate use.

Lightweight Floor Fills

To return to concrete construction, there has been developed a new method of pouring lightweight concrete in the field which produces a material especially adapted to floor and roof work. This method involves a new type of mixer in which a foam is beaten up and mixed with portland cement and fine sand. The result is a foamy, aerated, jelly-like slurry which, after it is poured on the job, sets the same as concrete. The material used for making the aerated foam is entirely neutral toward cement and steel, and the concrete protects piping against corrosion.

This method gives a positive, uniform and true aeration of the concrete. The weight of the wet mixture is checked continuously on a scale. The weight per cubic foot of the final material, or in other words its porosity, is predetermined. Four different weights, or degrees of porosity, are available for various uses.

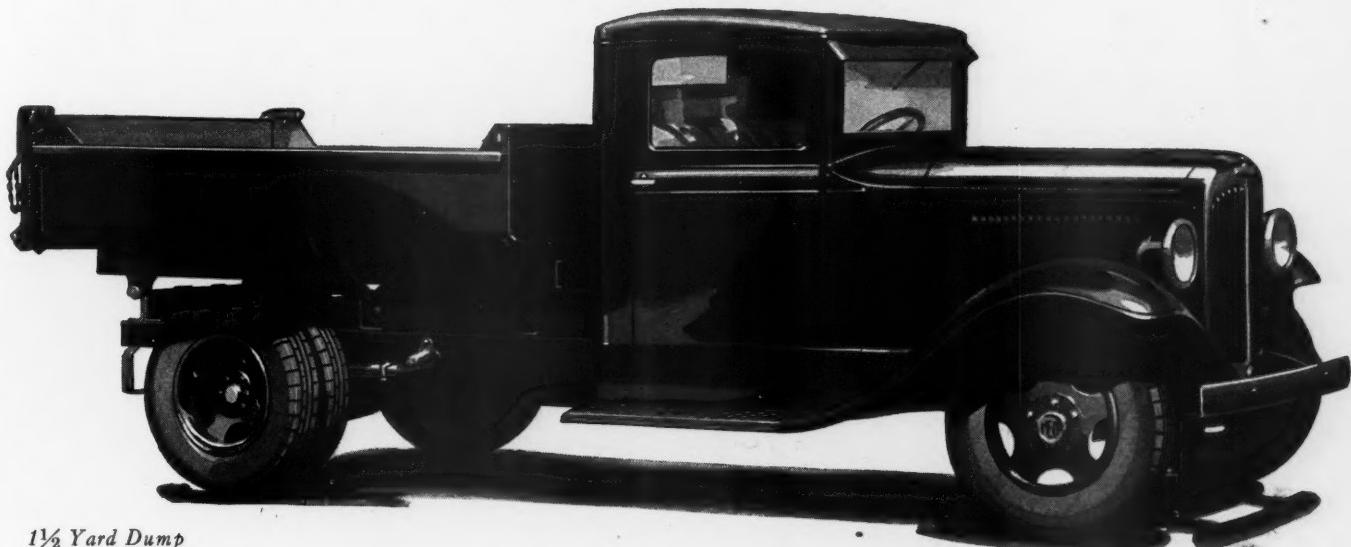
The different grades of this material range from a 60 to 70 pound mixture, of 600 to 900 pounds compression strength, for structural slabs and beams, to a 19 pound mixture, with a strength of 40 pounds, for insulating steam pipes and refrigerating lines.



Steel Joists and Forty-five Pound Porous Concrete Provide an Excellent Floor Construction of Light Weight.

\$625 for
REO Quality
REO Speed
REO Economy
REO Long Life

Four-Cylinder \$625, Six-Cylinder \$725
Chassis f. o. b. Lansing, Michigan
 DUAL WHEELS EXTRA



1½ Yard Dump
Standard Equipment

THE new Reo SPEED WAGON sweeps aside all previous work-limitations of trucks in the lowest price class. It fulfills *entirely* the exacting 1½-ton haulage demands of *every* industry.

REO has met the low-price 1½-ton market with the finest truck that sound engineering, extensive factory facilities and ample capital have yet been able to produce. *For comparable quality, size and specifications the new SPEED WAGON is the lowest priced 1½-ton truck in the world!*

REO MOTOR CAR COMPANY, LANSING—TORONTO

REO
SPEED WAGON

*Extra Size, Extra Strength, Extra Power,
with assured lower per-mile cost
of operation*

*4 cylinder engine—5 bearings • 6 cylinder engine—
7 bearings • Chromenickeliron cylinders • Extra
large piston displacements • Force feed lubrication
Strong channeled frame—7" deep • Four Speed
Transmission • Full floating rear axle • Forged
Spoksteel Wheels • Internal hydraulic brakes*

*Two liberal wheelbase lengths
More loading space behind cab.*

AVAILABLE WITH STANDARD AND SPECIAL BODIES FOR EVERY HAULAGE NEED
 WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER AND BUILDING AGE

Building Activities

The Month's News of the Industry

No Surplus of Residential Buildings Says Survey

ACCORDING to the semi-annual survey of the real estate market, recently completed by the National Association of Real Estate Boards, few representative American cities are over-built, either with apartment buildings or with single family residences. The figures show that, in 72 per cent of the 381 cities reporting, the demand for single family residences just about equals the supply; 17 per cent report an actual shortage, and only 11 per cent have an over-supply.

Sixty-five per cent of the cities report no over-supply of apartments; 12 per cent show a shortage; and only 23 per cent report an excess of multi-family dwelling.

Sixty-six per cent of the cities report no over-supply of business space; two per cent have a shortage of this type of structure; and 34 per cent report an over-supply.

The figures for residential buildings do not take into account the thousands of families which have doubled up, two or more families living in quarters normally designed for one family. Any general return of prosperity will cause a return of these families to individual dwellings, which would, with no increase in the present supply of dwellings, create an immediate shortage of dwellings.

The actual extent of this doubling up condition is shown in survey figures from St. Louis, Mo., where more than 13,000 families are living as extras in residential units of all types.

Law Protects Contractor

A NEW law, promoted by the Michigan Retail Lumber Dealers Association, and recently enacted by the Michigan State Legislature to take effect September 19, 1931, makes it a felony for contractors to misappropriate the funds of a building contract.

This law protects the responsible contractor and eliminates the irresponsible contractor who deliberately enters into a contract for the construction of a building at less than cost for the purpose of misappropriating the funds to the detriment of the owners, laborers, subcontractors and material men and the building industry generally.

The law provides that all moneys paid by the owner to the general contractor or subcontractors must first be distributed to those entitled to payment before any part of the contract fund

Coming Events

- Aug. 10-15, 1931—United States Building & Loan League, Annual, Bellevue-Stratford Hotel, Philadelphia, Pa.
- Sept. 17-18, 1931—National Hardwood Lumber Association, Annual, Hotel Sherman, Chicago.
- Sept. 19, 1931—Louisiana Retail Lumber and Material Dealers' Association, Quarterly, Lafayette.
- Oct. 12-16, 1931—American Gas Association, Annual, Atlantic City, N. J.
- Oct. 13-16, 1931—Illuminating Engineering Society, Annual, William Penn Hotel, Pittsburgh, Pa.
- Oct. 27-30, 1931—National Retail Lumber Dealers Association, Annual, Book-Cadillac Hotel, Detroit.
- Oct. 27-31, 1931—American Institute of Steel Construction, Annual, Greenbrier Hotel, White Sulphur Springs, W. Va.
- Nov. 10-12, 1931—American Petroleum Institute, Annual, Stevens Hotel, Chicago.
- Jan. 25, 1932—United Roofing Contractors Association, Annual, Louisville, Ky.
- Jan. 25, 1932—National Association of Sheet Metal Contractors, Annual, Louisville, Ky.
- Jan. 25, 1932—Roofing Contractors Division of the National Slate Association, Annual, Louisville, Ky.
- Jan. 25-29, 1932—International Heating and Ventilating Exposition, Cleveland, Ohio.
- Jan. 25-29, 1932—American Society of Heating and Ventilating Engineers, Annual, Cleveland, Ohio.
- Jan. 25-29, 1932—American Society of Refrigerating Engineers, Annual, Cleveland, Ohio.

can be appropriated to the personal use of the general contractor or subcontractors. Misappropriation of the building contract funds subjects the contractor or subcontractor violating the provisions of the law to imprisonment for from six months to three years, or a fine of one hundred to five thousand dollars.

Oil Burner Sales Increase

SUBSTANTIAL increases in business for the first six months of 1931, over the same period last year, were reported by twenty-five leading manufacturers of oil burning equipment at a recent manufacturers conference. The increases ranged from a few per cent in some cases to as high as 107 per cent in others.

Small Home Financing Corporation Launched

THE National Home Finance Corporation, an organization of leading retail lumber dealers operating in 44 states, has just been formed in Chicago, for financing small home construction. Alton J. Hager, president of Hager & Cove Lumber Co., Lansing, Mich., is chairman of the board. Arthur A. Hood, president of the Associated Leaders of Lumber and Fuel Dealers of America, and Emory J. Lee, of Ames, Emerich & Co., Inc., international investment bankers, of New York and Chicago, who developed the plan are members of the board of directors.

Other members of the board of directors are: John Dower, president, John Dower Lumber Co., Tacoma, Wash.; Marshall Forrest, vice-president, Ames, Emerich & Co., Inc.; Davis W. Glass, treasurer, Keystone Lumber Co., Pittsburgh, Pa.; W. L. Hixon, president, Hixon-Peterson Lumber Co., Toledo, Ohio; I. B. McFarland, general manager, Temple Lumber Co., Houston, Texas; Fred J. Robinson, president, Fred J. Robinson Lumber Co., Detroit, Mich.; and Fred Weherenberg, vice-president, Standard Lumber & Supply Co., Ft. Wayne, Ind.

Vacancy Low in Milwaukee

THE recent second annual occupancy survey of the Milwaukee, Wis., Real Estate Board showed an occupancy percentage considerably above the national average for other large cities of the country. The occupancy percentages for various classes of dwellings were as follows: single family houses, 97.99; duplex apartments, 95.61; apartments, 89. In stores the occupancy was 91.37 per cent. The number of excess, or doubled-up families, as counted by the mail carriers, who co-operate in this survey, was arrived at accurately for the first time and was found to be 7,101. Obsolete or unfit units have not been eliminated in the occupancy figures.

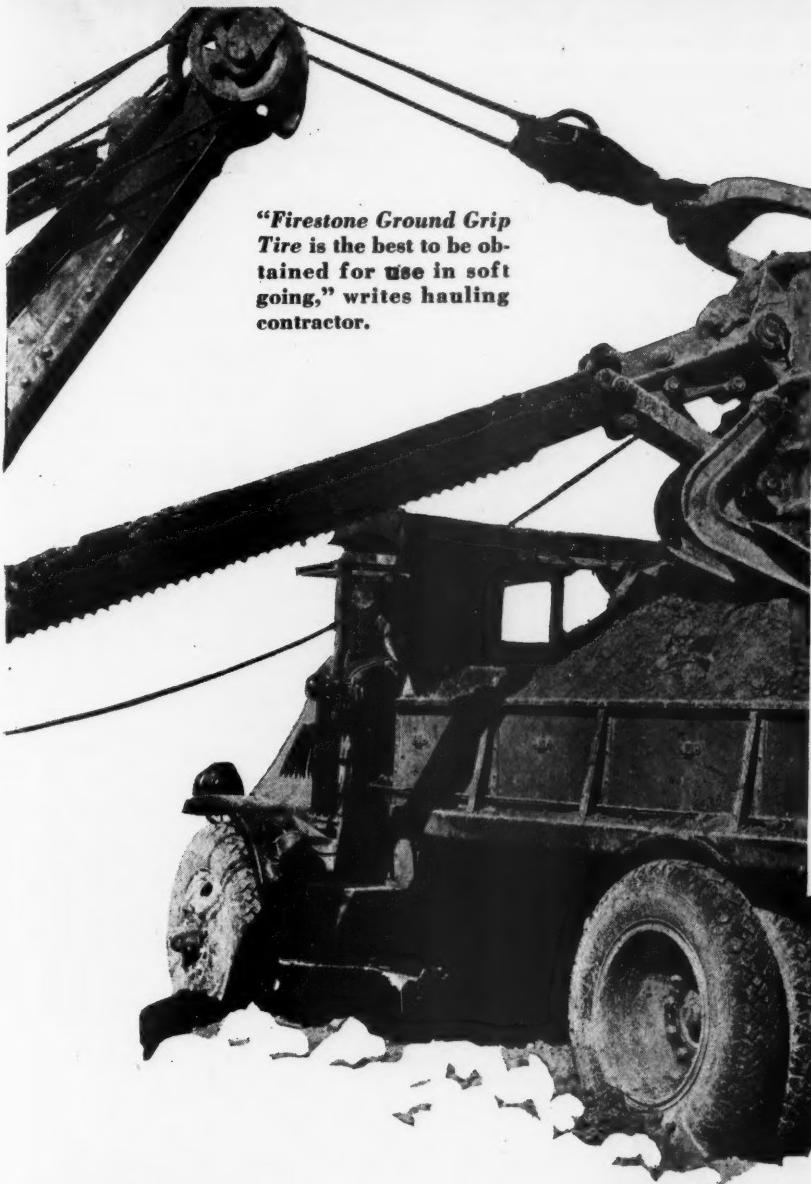
No Jobs at Boulder Dam

THE government has issued warnings to workers to stay away from the Boulder Dam project. The latest statement from the Department of Labor says:

"There is no work for mechanics and laborers at Boulder Dam. The contract was recently let, but preliminary work will not begin for 90 days. Thousands of applications for work are now on file. More than 1,000 unemployed are already on the ground. Do not go there except on recommendation of the United States Employment Service."

One Whole YEAR of CONTINUOUS SERVICE

only ONE tire delay!



"Firestone Ground Grip Tire is the best to be obtained for use in soft going," writes hauling contractor.

THE experience with a fleet of heavy duty construction trucks, prompts J. W. Owen, hauling contractor of Memphis, Tennessee, to write:

"Eighteen months ago, I equipped four of my AC Mack Dump Trucks with Firestone Ground Grip Heavy Duty Tires.

"During that time the trucks have had over a year's continuous service and from the appearance of the tires at this time, after having delivered approximately 20,000 miles, I know I am going to get many more months of service from them. Their performance has convinced me that the Firestone Ground Grip Tire is the best to be obtained for use in soft going.

"I might add that during all this time I have had but one tire delay."

Not promises, but actual performance such as this — that's what you're after when you purchase truck tires. And that's what you get when they're Firestone Tires. Firestone extra values — built into every tire bearing the Firestone name — give you 25% to 40% longer tire life, insure greater traction and greater speed without delay at most miles per dollar.

But convince yourself by changing over to Firestone Truck Tires. When purchasing new equipment, specify Firestone Gum-Dipped Tires, Firestone Puncture Proof Tubes and Firestone Rims.

Firestone

TRUCK TIRES

TIRES • TUBES • BATTERIES • RIMS • BRAKE LINING • ACCESSORIES

Copyright, 1931, The Firestone Tire & Rubber Co.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER AND BUILDING AGE

BUILDING SHORTAGE NOW IN MAKING

Colonel Ayres Analyzes Building Situation

DURING the depression that was under way 10 years ago the Cleveland Trust Company made a study of building conditions in 50 leading cities in order to find out whether or not there probably existed at that time a shortage of building construction. One of the products of that study was a diagram which has been brought up to date, and is reproduced on this page. According to Colonel Leonard P. Ayres, this study "indicates that when the depression of 1921 came into being there existed in the cities of this country a great accumulated shortage of building construction, but that when the present depression came no such general shortage existed.

The upright columns of the diagram represent for the 32 years beginning with 1900 the per capita values of the building permits issued, if the costs of building had remained constantly at the levels that prevailed in 1913. Through these upright columns a trend line has been drawn. It is based on the data for the years through 1916, and indicates what the computed normal volume of building would have been for those years. This trend line has been extended to cover the entire period through 1931.

"In the years before the war the volume of building fluctuated slightly above, and slightly below normal, year by year, and no important surpluses or shortages developed. During the war period, and the years immediately following, the volume of new construction fell to abnormally low levels, and a large shortage developed, amounting in the aggregate to the equivalent of all the construction that would normally be completed in about two and a half years. The pressure to make good that shortage was one of the stimulating forces that operated to lift

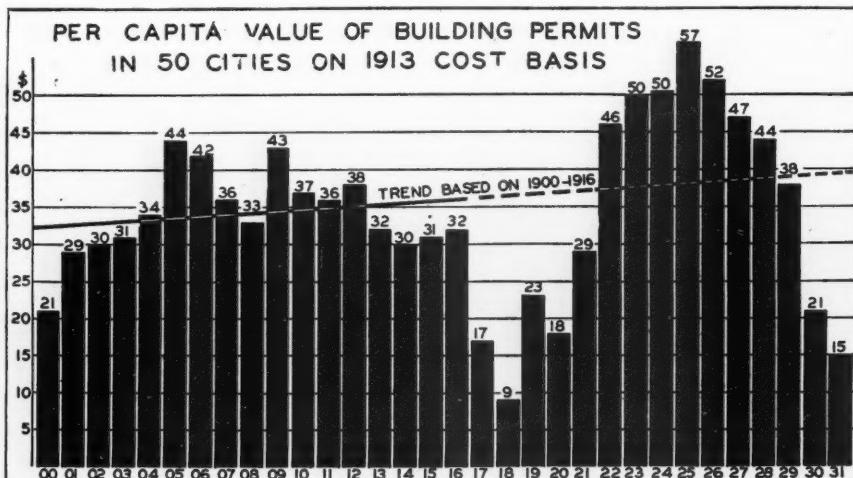
business and industry out of that depression.

"The depression was at its worst in 1921, but the volume of building sharply increased in that year. It continued to advance until in 1925 new construction was going forward at a rate fully 50 per cent above the computed normal. It then began a decline that continued until the volume for 1929 was slightly below normal. By that time the great accumulated shortages of the war, and post-war period, had been made up, but no important surplus had been created. According to this showing the present depression came at a time when our building needs had been fully met.

"Now a new shortage is in the making. The volume of new construction in these cities in 1930 was only about one-half the normal amount. The figure shown for 1931 is based largely on estimates, but the prospects are that the new building done this year will not be greatly over one-third of the computed normal volume. It now seems probable that when this depression has run its course a recovery of business will bring a restoration of building to its normal activity, and it does not seem likely that important increases in building will come first, and be effective in helping create business recovery. The 50 cities from which data have been taken for these estimates include in their populations about one-fourth of all the people in this country."

Offer Consultation Service

THE Porcelain Enamel Institute, 612 N. Michigan Ave., Chicago, has announced the addition of a Manufacturers' Technical Consultation Service to its activities. The service is for the benefit of manufacturers who wish to determine whether porcelain enamel is a finish adaptable to use on their products.



Mehren Heads Cement Association

EDWARD J. MEHREN, formerly editor of Engineering News-Record and later vice-president and editorial director of the McGraw-Hill Publishing Co., has been elected president of the Portland Cement Association, 33 W. Grand Ave., Chicago.



Edward J. Mehren

This is the first time that a man from outside the cement industry has been chosen to head the association and also the first time that a president will devote his entire time to this work. The latter has been made necessary by the increasingly heavy duties of the position.

Takes Over Robras Sales

FOR several years the Rome Radiation Company, division of Revere Copper and Brass Incorporated, has been engaged in the manufacture of a non-ferrous radiator, sold under the trade name of Robras, by the Rome Brass Radiator Corporation, of New York City. The selling agreement between these two organizations has been discontinued recently and the Rome Radiation Company has established its own sales organization to promote and continue the sale of Robras radiators.

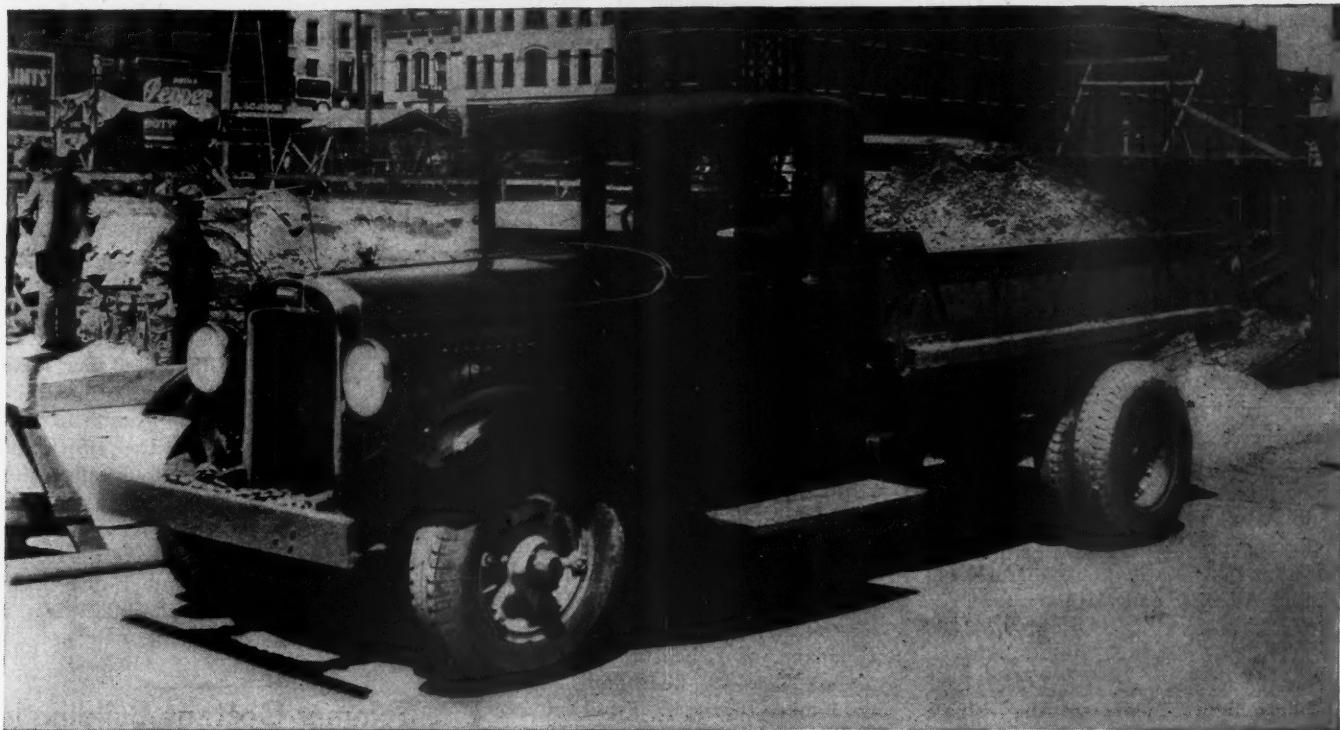
This move brings into effect a consolidation of manufacturing and selling organizations which is expected to result in more prompt deliveries and better service. There has been no interruption in shipments of Robras radiators due to this change.

The general offices of the company will be in Rome, N. Y., with branch sales offices in Boston, Chicago, New York, Philadelphia, and Washington.

Legion Starts Drive

A NATION-WIDE campaign for 10,000 American Legion posts to conduct surveys on needed public improvements, in their various communities, and then get behind movements, in co-operation with the proper public officials, to have these projects started, was recently announced by Howard P. Savage, past national commander and chairman of the Legion's National Employment Commission.

OVER 400,000 DODGE TRUCKS CHOSEN BY TRUCK USERS



**—and the experience gained
in building this huge volume
safeguards your choice today**

Contractors and other business men—with every conceivable kind of hauling job to do—have purchased over 400,000 Dodge Trucks. » » What more conclusively proves the solid worth of these dependable workers? And what could be more advantageous to you than the experience gained by Dodge engineers and workmen in the designing and building of this enormous total. Such experience assures the modern design, precision construction and part-to-part balance that mean even greater Dodge dependability, lower

costs and more able performance throughout the truck's unusually long life. » » Inspect and test Dodge Trucks—especially the Standard 1½-ton chassis which is only \$595, f. o. b. Detroit. You will say they are every inch modern trucks—exceptional values at their low prices.

PAYOUT CAPACITIES IN THE HEAVY-DUTY LINE RANGE FROM 3,500 TO 11,175 POUNDS—AND UP, FOR TRACTOR AND TRAILER SERVICE. PRICES ARE EXCEPTIONALLY LOW. IN THE STANDARD LINE RANGES IN PAYLOAD CAPACITY FROM 1,200 TO 4,300 POUNDS AND INCLUDES THE 1½-TON CHASSIS AT

\$595
F. O. B. DETROIT

**TO HELP LOWER YOUR HAULING COSTS
OPERATING RECORD BOOK FREE**

DODGE BROTHERS CORPORATION
Detroit, Michigan

D-6

Send your Operating Record Book. I understand there is no obligation.
NAME _____

ADDRESS _____

CITY _____ STATE _____

Number of Trucks Operated (Book for each will be sent) _____

CURRENT CONSTRUCTION FIGURES

Prospects for Third Quarter Look Brighter

CONSTRUCTION contracts during the second quarter of 1931 again showed a loss from the same period last year, amounting to about 37 per cent, while the total for the first half of 1931 was about 31 per cent less than that for the first six months of 1930, according to figures reported by the F. W. Dodge Corporation. The loss in residential contracts, however, amounted to only 15 per cent, as compared with last year.

As compared with the preceding month, June showed a gain of 6.5 per cent. This gain was accounted for by a substantial increase, amounting to 39 per cent, in public works and utilities. In construction other than public works and utilities there was a loss of 6.5 per cent.

Total contracts for June amounted to \$456,334,578, which was divided between the various classes of construction as follows:

Residential Buildings	\$171,286,087
Commercial Buildings.....	30,413,020
Factories	9,751,060
Educational Buildings	24,752,420
Hospitals and Institutions	10,613,680
Public Buildings	17,023,490
Religious and Memorial...	10,101,190
Social and Recreational....	12,430,440
Public Works and Utilities	169,963,200

Total \$456,334,578

These figures represent the volume of contract awards for the entire country, as estimated by the AMERICAN BUILDER AND BUILDING AGE. They are based on the figures for contracts awarded in the 37 eastern states, as reported by the F. W. Dodge Corporation, together with factors to provide for building in the 11 western states and for the smaller, unreported projects not covered by the Dodge figures.

Last month a factor of 12 per cent was used to account for the western states. The loss in these states, during June, was proportionately greater than in the eastern states so the normal factor of 10 per cent has been used in this estimate.

Only a portion of the new building, modernizing and repair projects of less than \$5,000 each is covered in the Dodge reports. This work, a large proportion of which is rural, reached its normal level of 25 per cent in May, and has since been moving forward at this rate. A factor of 25 per cent, therefore, has been used to account for it. Since practically all of this work is

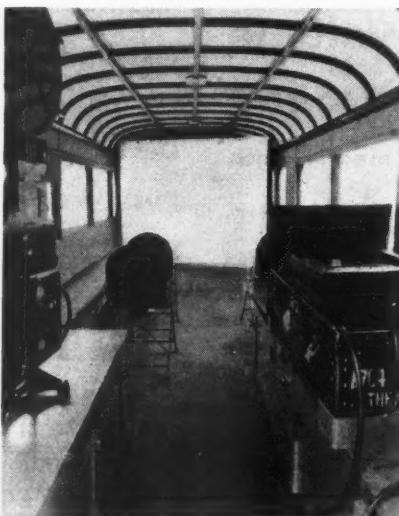
home building or remodeling, it has been classified under Residential Buildings in the tabulation.

In the opinion of the Dodge organization, the outlook for construction as a whole, for the third quarter of 1931 affords real hope. This organization predicts that the third quarter will show a loss, as compared with the same period of 1930, probably not to exceed 20 per cent, in contrast with losses of 24 and 37 per cent for the first and second quarters, respectively.

The non-residential loss should not exceed 30 per cent, as contrasted with 41 and 43 per cent for the first two quarters. The indicated loss for public works and utilities should not exceed 20 per cent as contrasted with 16 and 40 per cent for the first and second quarters, and the residential loss should not exceed 15 per cent, in contrast with losses of 4 per cent and 24 per cent, respectively, for the first and second quarters of this year, compared with the same periods of 1930. This prediction seems well founded and would indicate a stabilizing tendency in the industry.

Talkies Sell Insulation

TALKING, moving pictures are, for the first time, being used for personal selling to the individual prospect, by the Armstrong Cork & Insulation Company, of Lancaster, Pa., in introducing Temlock fiberboard insulation to lumber dealers. Two automobile trailers, fitted up as miniature motion picture theaters, are used by salesmen in calling at lumber yards.



Interior of Trailer Fitted Up as a Portable Talking Picture Theater for Sales Work by the Armstrong Cork & Insulation Co.

Moore Heads Property Owners

A MAN who has proved that tax relief for real estate can be accomplished has been elected Chairman of the National Property Owners Division of the National Association of Real Estate Boards. A. L. Moore, attorney, of Pontiac, Mich., the new division head, will take office on January first, succeeding Judge Arthur J. Lacy, of Detroit.

As chairman of the Pontiac Property Owners Division, Mr. Moore persuaded the Board of Supervisors and county department heads to consider the adoption of a central financial control for his county and a plan is now being worked out, with a reduction of \$2.30 per thousand on this year's estimated taxes, already accomplished.

Start Mail Order Yards

WHAT may be the first of several retail stores and lumber yards in the New York metropolitan district, has been opened at Keyport, New Jersey, by the Home Construction Division of Sears, Roebuck & Company.

According to Gustave Meissner, New York manager of the Home Construction Division, this represents an important experiment in the efforts of Sears, Roebuck & Co. to localize and decentralize its Home Construction Division sales activities. If successful, this venture will probably result in the establishment of a number of similar retail stores and yards at selected points in the New York metropolitan district, it is said.

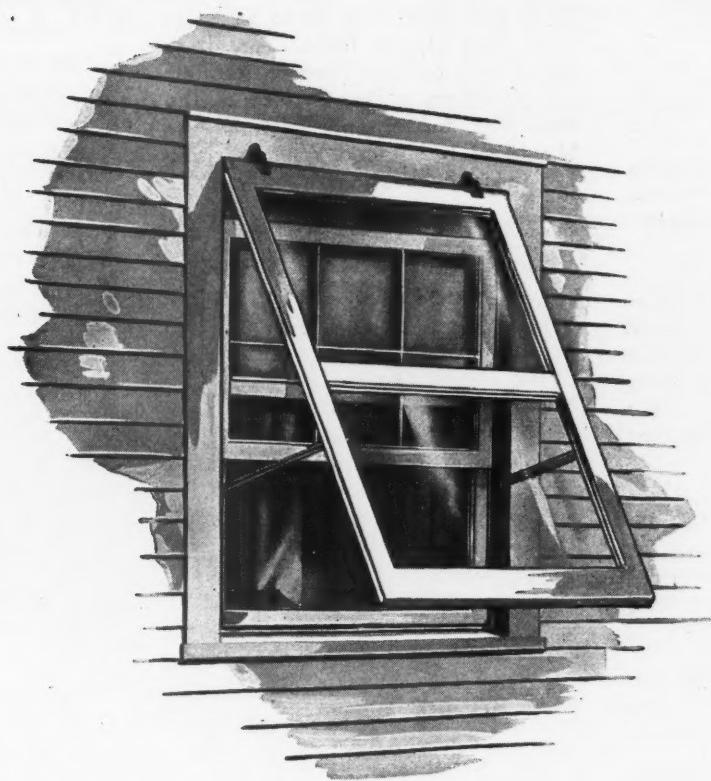
Summer Cottage Building Is Active

BUILDING is active this year in the shore colonies of New England. A survey of building construction shows that this field has not been affected by general conditions, according to the Hartford (Conn.) Times. Builders, developers and lumber companies are reporting more cottages completed or under construction this year than last. Along one section of the Connecticut shore, the total of new summer places, ranging from attractive five-room cottages to ten rooms and more, is conservatively placed at well over a hundred.

Prepare Insulation Book

SECRETARY Lamont, of the U. S. Department of Commerce, has recently appointed a subcommittee, of the National Committee on Wood Utilization, to prepare a booklet which will acquaint builders as well as prospective home owners, with complete facts in regard to advantages and economies of insulating houses.

INCREASE YOUR FALL PROFITS



Storm Sash means additional fall and winter business for the builder and sash and door manufacturer — and — it means reduced fuel bills for the customer. There has never been a better time to talk economy to the customer. This market is literally "wide-open".

Libbey-Owens-Ford Glass adds quality to the market — and offers the advantage of a nationally advertised product. Libbey-Owens-Ford advertising in leading magazines points out the great saving in fuel bills and the added comfort of a home equipped with storm sash and storm doors.

LIBBEY · OWENS · FORD GLASS COMPANY, TOLEDO, OHIO

Manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Shatterproof Safety Glass, also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corporation of Kingsport, Tennessee . . . This label appears on each light of L.O.F "A" Quality Glass. Printed blue for double strength and red for single strength.



Listen to Floyd Gibbons every Sunday evening at 10:15 Eastern Daylight Time, over WJZ and associated NBC stations

LIBBEY · OWENS · FORD QUALITY GLASS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER AND BUILDING AGE

The Builder's Library

Equipment for Buildings

Fireplaces That Ventilate

"Bennett Bonded Fireplaces" is the title of a new booklet published by the Bennett Fireplace Corp., Norwich, N. Y., containing complete descriptions and illustrations of fireplaces which provide a circulation of warmed, fresh air, by means of a distinctive design and construction.

Vertical Parking Machines

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued a new booklet describing a vertical parking machine which has recently been perfected and which provides for automobile parking, in a restricted space.

Concealed Radiation

The Thatcher Company, 39 St. Francis St., Newark, N. J., offers a descriptive folder on its new concealed radiators which have been designed for heating efficiency and long service.

Bathroom and Kitchen Fixtures

The Kohler Co., Kohler, Wis., has prepared a booklet entitled "To help you plan—Beautiful and Dutiful Bathrooms and Kitchens," which presents typical examples of this company's installations together with a color chart and suggestive designs.

Fireplace Mantels

The Brecher Co., 433-435 W. Jefferson St., Louisville, Ky., offers its catalog No. 1-40 on "Mantel-pieces and Fireplace Accessories" which illustrates a large number of handsome designs.

Temperature Control Equipment

The Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., has published a new booklet on the subject of the Modustat automatic orifice system of individual room temperature control, and on the Modutrol system of air conditioning control.

Automatic Radiator Control

The American Radiator Company, 40 W. 40th St., New York City, offers a new booklet on its Arco Radiatherm automatic radiator control, which is a combination of radiator valve and thermostat.

Permeffector Lighting

This is the title of catalog No. 34 issued by the Pittsburgh Reflector Co., 304 Ross St., Pittsburgh, Pa., on its silver-plated, glass reflectors for all special lighting purposes.

Iron and Steel Specialties

The A. L. Swett Iron Works, Medina, N. Y., offers a new catalog of its various iron and steel products for the plumbing and building industries.

Check These Items Every Month and Write for Those You Need to Keep Your Files Up to Date. Any Item Listed Will Be Sent Free on Request Except Where a Price Is Noted. The American Builder and Building Age Should Be Mentioned When Writing for These Publications.

Construction Materials

Metal Lath Products

The United States Gypsum Company, 300 W. Adams St., Chicago, has issued a new handbook on its Red Top metal lath products.

Waterproof Cement

A circular on Medusa Stoneset—a Non-staining Waterproof Mortar Cement, is offered by the Medusa Portland Cement Company, 1002 Engineers Bldg., Cleveland, Ohio.

Welding Aluminum

The Aluminum Company of America, Pittsburgh, Pa., is distributing a card carrying complete "Instructions for Welding Aluminum".

Steeltex Floor Lath

The National Steel Fabric Company, Union Trust Bldg., Pittsburgh, Pa., has completed a new booklet on its "Steeltex Floor Lath for Concrete and Gypsum Floors and Roof Slabs," including detailed specifications.

Screened Casements

"Screened Casement by Lupton" is the title of a booklet recently published by David Lupton's Sons Company, Allegheny & Tulip Sts., Philadelphia, Pa., covering a new type of casement window equipped with all-aluminum screens and special hardware.

Contractors' Equipment

Dunbrik Machines

The "Dunbrik Manufacturing Digest," prepared especially for the guidance of Dunbrik manufacturers by the W. E. Dunn Mfg. Co., W. 24th St., Holland, Mich., is a new booklet containing complete information on this highly profitable business.

Conveying Machinery

A new, complete catalog on its elevating and conveying machinery has recently been published by the Fairfield Engineering Co., Marion, Ohio.

Wire Engineering

The June-July issue of "Wire Engineering" periodical of John A. Roebling's Sons Company, Trenton, N. J., is devoted to the general subject of data on the replacement of elevator ropes, including strength charts.

Miscellaneous Publications

"Furniture, Its Selection and Use"

This furniture manual, prepared by the National Committee on Wood Utilization, Department of Commerce, is described as containing all the information anyone needs in order to furnish the home comfortably and tastefully, and as being as interesting to the expert as to the beginner. It includes information on materials, period styles, repairs and other subjects. From the Superintendent of Documents, Government printing office, Washington, D. C. Price, 20 cents.

Dealer Relations

"Making the Dealer an Adviser" is a new booklet published by the Policyholders Service Bureau, of the Metropolitan Life Insurance Company, One Madison Ave., New York City, containing the results of a survey of methods used by manufacturers to improve and strengthen dealer relations.

"Standards Yearbook 1931"

This reference book of standardization progress, compiled by The National Bureau of Standards, Department of Commerce, the 1931 edition of which has recently been announced, is available from the Superintendent of Documents, Government Printing Office, Washington, D. C. Price, \$1.00.

Government Publications

The U. S. Department of Commerce, Division of Building and Housing, Bureau of Standards, Washington, D. C., has published the following reports and surveys: "Survey of City Planning and Related Laws in 1930" by Lester G. Chase; "A Tabulation of City Planning Commissions in the United States," compiled by Lester G. Chase; "Zoned Municipalities in the United States," by Norman L. Knauss; and "Survey of Zoning Laws and Ordinances Adopted During 1930," by Norman L. Knauss.

Southern Pine Industry

"Economic Conditions in the Southern Pine Industry," is the title of a report presented to the U. S. Timber Conservation Board by the Southern Pine Association, New Orleans, La.

Treated Lumber

"Treated Lumber, Its Uses and Economies," is a new bulletin published by the National Committee on Wood Utilization. It may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.

"...and the contractor says TEMLOK adds only 1%"

Your clients depend upon you to provide permanent comfort and fuel-saving—and that means Armstrong's new low-cost building insulation.



YOUR clients want to build a \$15,000 house. Naturally the question of cost comes up. That's the time to talk about Temlok. On that house Armstrong's new improved fibreboard insulation adds on an average only \$150 to the total building cost—and quickly pays for itself.

The extra 1% for Temlok will give permanent comfort and permanent fuel-saving. Your clients save from 20% to 40% on the fuel bills the first year and every year.

Temlok is permanent insulation. It is made from the heartwood fibres of Southern pine. These fibres are resin-impregnated by Nature. When fabricated into insulation board, they still resist moisture permanently and naturally. Therefore Temlok performs efficiently for a lifetime. It does not buckle or warp.

Temlok also has low conductivity of heat. It is easily handled—easy to cut, saw, and nail. Shipped in securely wrapped bundles ready for the job. Made in full half-inch and one-inch thicknesses. You can use either Temlok Insulating Board to replace sheathing, line attics, garages, and other buildings, or Temlok Insulating Lath as a plaster base.

Remind your clients, too, that Temlok is made by Armstrong. For years Armstrong has been recognized as a leader in the production of high grade insulations and as the maker of fine linoleums. We'll gladly send you a sample of Temlok and further data, including a specifications booklet giving a complete description of this new Armstrong product. *Armstrong's*
Armstrong Cork & Insulation Co.,
964 Concord Street, Lancaster, Pa. 
Product

Armstrong's
TEMLOK

BUILDING INSULATION

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER AND BUILDING AGE



ARMSTRONG CORK & INSULATION CO.
964 Concord St., Lancaster, Pa.

Please send me information regarding Armstrong's Temlok, the new fibreboard insulation fabricated from the Heartwood of the long leaf Southern Yellow Pine.

Please send sample.

Name.....

Street.....

City..... State.....

You Can Earn STEADY PROFITS

with AMERICAN Machines

American Machine Owners make big money even in dull seasons. Contractors, Builders, Carpenters, Cabinet Makers, Painters, etc., earn steady, substantial profits the whole year round.

\$125 a week with the ELECTRIC CARPENTER

A complete planning mill in itself. 7 machines in one: Saw Table, Shaper, Sander, Mortiser, Lathe, Jointer and Fold-over Band Saw. You can increase your shop production, triple your profits and turn out far better work in less time. Wise contractors the country over are keeping busy by making furniture, built-in cabinets, etc.



We help you by suggesting hundreds of salable articles to make, how to obtain plans, etc.

Floor Surfacing Earns EXTRA PROFITS Even in Slack Times



100% Satisfaction

Guaranteed in these and all other AMERICAN machines; Bench Sanders, Terrazzo Machines, Band Saws, Mortisers, Lathes, Jointers and the new Greyhound Sliding Swing Saw.

Mail the Coupon!



Full Information Without Obligation. Send Coupon Now.



AMERICAN Maintenance Machine Waxes, Polishes, Scrubs

The AMERICAN FLOOR SURFACING MACHINE COMPANY

544 S. St. Clair St.

Toledo, Ohio

- Electric Carpenter
- Greyhound
- High Production
- Handy Sander
- Maintenance Mach.
- American Method of Floor Finishing

Please rush full particulars about the Money-Making AMERICAN MACHINES which I have checked.

NAME _____

ADDRESS _____

City _____ State _____

Occupation or Business _____

The Production of Low Cost Housing

(Continued from page 37)

(see illustration). Quantities, unit prices and total costs are shown for every conceivable item, all being parts of twenty-one major operations on each job. As the job progresses, costs are accurately kept for each item through its account number and when an operation of, say, 25 houses is completed, these actual costs are checked against the estimate, the same form being used. When records like these are kept then costs can be closely studied and analyzed.

Records are essential for a correct knowledge of costs but they are not all that is necessary. A successful row type builder in one large city who has been accused of not knowing his costs, really has a keen eye for the dollar, and is one of the shrewdest buyers in the business. He gets his labor at a good price, gets concessions from manufacturers, buys cheaply, keeps his office overhead down and makes money. Knowing costs is one thing but being able to bring them down is another.

Perhaps, in the end, it is all a question of management. Some builders are shrewd buyers, able to handle labor, capable of analyzing operations; others are not. One successful residential builder whose operations cover more than thirty cities and towns in the country, places management at the top of the list in the factors that influence construction costs. In his opinion, three chief factors are operative in construction costs: (1) Management; (2) Type of construction; and (3) Application of materials.

He has a special type of construction which he licenses out to builders, hence his emphasis on the second factor. By application of materials, he means the study of new materials and products that are available and their application to practical residential building.

The use of substitute materials has often been held up as offering the best opportunity to cut down on the cost of dwelling construction but observation of the methods of the most successful builders shows that they use, not one method, but a combination of methods, to achieve their results.

Twelve Ways to Cut Costs

On any one operation, whether it is only one house or a group of houses, there are about a dozen ways of cutting costs, most of them legitimate, some of them not so legitimate. These ways to cut costs may be listed down as follows:

1. Getting cheaper labor.
2. Getting more out of labor.
3. Getting cheaper materials and products by wholesale buying and in other ways.
4. Analyzing building operations so as to cut down on the time required.
5. Devising a design that is easily framed, not cut up, simple to erect, with a room arrangement economical to construct, with an appealing exterior that looks more expensive than it actually is.
6. Putting up row housing or a special type of construction of some kind.
7. Using modern machinery, tools and equipment.
8. Using substitute materials that are cheaper but equally efficient.
9. Legitimately utilizing a different kind, size, and grade of lumber or other material.
10. Reducing the quantity of material.

(Continued to page 92)



Making the Sun Look Brighter

* * * Here are a few of the newer buildings which will be brighter because they are glazed with Lustraglass, the clearer, flatter, better glass for windows:

SCHOOLS—Junior High School, Worcester, Mass.—Adolph Johnson, Architect + Westmiddle School, Hartford, Conn.—Carl J. Malmfeldt, Architect + Senior and Junior High School, Rye, N.Y.—Chapman & Woolsey, Architects + Bowman School, Washington, D.C.—M. L. Harris, Architect.

BUILDINGS—Illinois Medical & Dental Building, Chicago, Ill.—Granger & Bollenbacher, Architects + Washington Athletic Club, Seattle, Wash.—Sherwood D. Ford, Architect + W. W. Orr

Doctors Building, Atlanta, Ga.—Pringle & Smith, Architects + Medical Chamber Building, New York City—Polhemus & Coffin, Architects.

HOSPITALS—Falk Clinic, Pittsburgh, Pa.—E. P. Mellon, Architect + Pownal State School Hospital, Pownal, Maine—Harry S. Coombs, Architect + Wm. H. Mayberry Sanitorium, Northville, Mich.—City of Detroit, Engineers and Architects + Cherokee State Hospital, Cherokee, Iowa—H. J. Liebbe, State Architect of Iowa.

Lustraglass is the "whitest" of all glass made for windows. It transmits more daylight and a substantial amount of the shorter (more valuable) ultra-violet rays of sunlight, which are shut out by ordinary window glass, yet, Lustraglass costs no more than any good window glass... Lustraglass is rightly named. Its brilliant lustre and freedom from distortion instantly distinguish it as a superior product... Write for Booklet A-430... Address: American Window Glass Company, Fifth Avenue, Pittsburgh, Penna.

LUSTRAGLASS
FLAT-DRAWN

IT COSTS NO MORE



This Label appears on every light of genuine Lustraglass

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER AND BUILDING AGE

Insulate with U. S. MINERAL WOOL

The perfect insulator

**COLD PROOF . . . HEAT PROOF . . . FIRE PROOF
SOUND PROOF VERMIN PROOF**



Greater Comfort and Actual Saving!

The proper insulation of a home is not an additional building expense but is a positive money saver.

Year after year, as long as the building lasts, the original installation of Mineral Wool never fails to provide greater living comfort and reduced expense.

It saves annually about one third in fuel costs, assures a warmer house in winter, a cooler one in summer, thoroughly sound—deadened and free of vermin.

Although the nominal cost of installation will be made up in a short period of time, the added comfort is alone worth many times the original outlay.

Our FREE booklet explains the real economy of insulation. Send for it and free sample of Mineral Wool.



U. S. Mineral Wool Company
280 Madison Avenue, New York

Western Connection

Columbia Mineral Wool Co.,

South Milwaukee, Wis.

U. S. MINERAL WOOL CO., DEPT. B.
280 Madison Ave., New York.

Send FREE sample and illustrated booklet to

Name.....

Address.....

City..... State.....

BARCOL OVERdoor



Easy to open and close

BARCOLOVERdoors open and close easily regardless of the weather. Cam-controlled swinging rollers permit the door to run free of the stop strips until just before closing. As these rollers are of the ball-bearing type, and as the OVERdoor is perfectly balanced by means of special counterbalancing coil springs, very little effort is required to open or close the door. These springs, being individually "tailored" for each door, furnish an effective means of balancing the unsupported weight of the door while it is being opened or closed.

Made from high grade, selected lumber, the OVERdoor will give many years of useful service. Hardware is rust-proofed. Bottom of door is provided with rubber astragal, to seal floor opening against rain or snow. Carried in stock in the sizes listed at right.

Mail Coupon for Catalog

If you will fill out and mail the coupon below we will gladly send you a copy of our new Catalog, illustrating and describing the OVERdoor's many advantages.

BARBER-COLMAN COMPANY
ROCKFORD, ILLINOIS, U.S.A.

Also distributed by Carr, Ryder & Adams Company and affiliated houses

BARBER-COLMAN COMPANY
ROCKFORD, ILLINOIS

Please send me a copy of your new OVERdoor Catalog, as advertised in American Builder.

AB-8-31

Name _____

Address _____

City _____

State _____

FOP ADVERTISERS' INDEX SEE NEXT TO LAST PAGE



STOCK SIZES of BARCOL OVERdoors

—
8'-0" x 7'-0"
8'-0" x 7'-6"
8'-0" x 8'-0"
8'-0" x 10'-0"

11. Securing the cheaper financing or reducing carrying charges.
12. Buying land cheap.

Occasionally, some speculative builder will employ a combination of legitimate and illegitimate methods to attain his ends. He may "chisel" his subcontractors and mechanics down to the last cent, he may write low specifications on fundamentals, he may not put in all improvements, leaving buyers to face additional assessments, high maintenance expense and excessive obsolescence. He may produce houses that are cheap in design. He may reduce office overhead by keeping no books and cutting advertising, sales and general overhead expense to the minimum. On the other hand, he may buy well and build efficiently from the standpoint of speed.

Still another builder may buy well, build on cheap land, use modern machinery and methods, yet have high costs because of heavy overhead charges and unusual topographical or climatic conditions not foreseen when the land was purchased.

Any builder may take these methods of cutting costs and apply them at many different points in his operations. He may go to considerable lengths, in some cases, in order to get his costs down, as one builder did when he bought up a third-rate dealer's establishment in order to get materials and products at wholesale prices. Let us analyze these methods of cutting costs, one by one:

Analyzing Cost Cutting Methods

(1) *Getting cheaper labor.* Some big builders have adopted the method of making stringent terms with sub-contractors whereby the latter agree to do work for low fees. The builder buys materials and gets them at low price but the sub-contractor handles the labor. In situations like this, labor sometimes suffers a reduction in wages. In other localities, where the labor situation is well in hand, builders get excellent workmanship at a fair wage rate and costs are not excessive.

(2) *Getting more out of labor.* It has been said that labor is much more responsive now than formerly and that the increased willingness to do more work has resulted in reduced costs. Says Andrew J. Eken of Starrett Brothers & Eken, builders of the Empire State Building, New York City: "In the main, wage schedules have been very generally upheld. The increased productivity of labor is virtually tantamount to reduction. By greatly increasing its productivity, labor has done as much for cutting building costs as it would have by taking a substantial reduction."

It is amazing what good management can do with labor in the way of increased production. One builder tells of stimulating his men into a competitive spirit. After training them for a period under a good foreman and arousing them so that they enter the swing of the work enthusiastically, he has been able to turn out unusually good work in faster time.

Management of men is one of the builder's foremost responsibilities and should be one of his foremost capabilities. Well-trained foremen are indispensable and often can be depended upon alone to work a job through in good style.

(3) *Getting cheaper materials and products.* Some builders who have schedules calling for the erection of fifty houses or more are able to deal direct with manufacturers and on the basis of large, bulk orders often receive substantial reductions on the price of materials, products and equipment of all kinds. Although mass

(Continued to page 94)

If your plan

Calls for Tile or Shingle Roofing... Let Edwards figure it in metal!

Send us your roofing blue prints for architecturally correct, beautiful, low cost, permanent

EDWARDS Metal Spanish Tile or Shingles

EDWARDS Metal Spanish Tile and Shingles have stood the test of time. Thousands of installations everywhere attest their lasting beauty.

All the massive beauty of clay tile or slate at a fraction of the weight and cost. Require no heavy supporting roof structure. Easy to lay. Joints interlock, insuring perfect alignment and leak-proof protection.

Edwards Metal Shingles made in plain and ornamental designs to harmonize with the architectural theme of the building.

Made in galvanized steel or terne plate (tin), copper bearing steel, sheet zinc or pure copper. Cannot crack, split, curl, break or blow off. Proof against fire, lightning, wind and weather. Lower insurance . . . lower upkeep.



Edwards Metal Spanish Tile . . . the most beautiful roofing in the world . . . made in copper, zinc, steel and tin. Write for prices.

For all types of buildings from garage to cathedral. Let us figure more profit and value into your next roofing job. Write for architectural book AB.

THE EDWARDS MANUFACTURING CO.

542-562 Eggleston Avenue
Cincinnati, Ohio

*World's largest manufacturers of
Sheet Metal Building Materials*

Saves Money For You and Your Clients

- ¶ Cabot's Quilt is quickly and cheaply installed in any house. Special 18" width goes between studs or rafters.
- ¶ Cuts heating-plant size and cost.
- ¶ Saves hundreds of dollars in fuel bills.
- ¶ Insures year-round comfort.
- ¶ Is rot-proof, vermin-proof, fire-resistant.
- ¶ Has everlasting insulating power.

Mail the coupon below

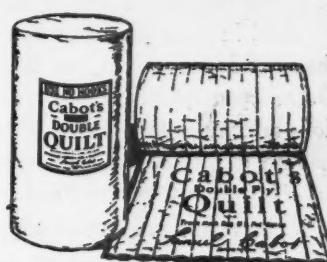


Home in Bryn Mawr, Pa. Architect and builder, Wallace & Warner, Philadelphia. Insulated against summer heat and winter cold with Cabot's Quilt.

Cabot's

Heat-Insulating,
Sound-Deadening

"Quilt"



Made by the makers of the famous Cabot's Stains and Cabot's Collopkates, for use instead of paint.

Samuel Cabot, 141 Milk Street, Boston, Mass.
Inc.

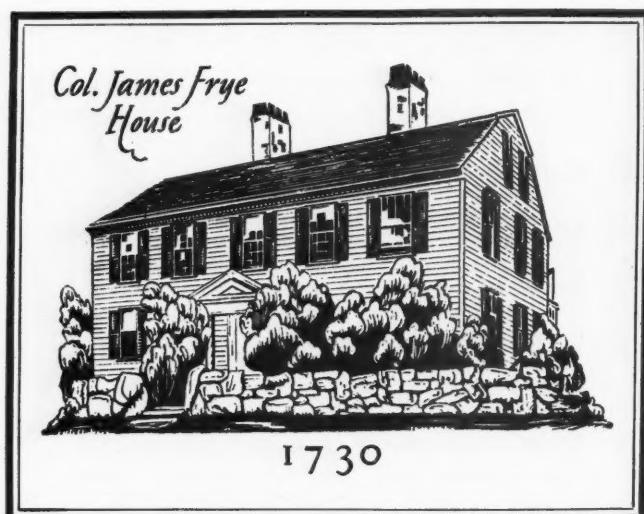
Please send me your Quilt Book.
Build Warm Houses

Name

Address AB-8-31

Y

THIS IS THE PINE THAT Belongs IN THE Early-American Scene



At North Andover, Mass. Built of White Pine and still standing

Most builders know that the beauty of New England wood-constructed buildings, so skillfully designed, depended primarily upon two things: the craftsmanship of the builders, and the pine with which they worked. . . . But some builders may not know that Idaho White Pine, closest of kin to that earlier lumber, can be used in homes you construct today!

Nature's finest building lumber, Idaho (genuine) White Pine is distinctly straight-grained and soft-textured. With a thin and even cellular structure, the wood mills easily and smoothly to any pattern. Thoroughly seasoned, shipped dry, it takes nails and screws close to the end of the board, *to hold*; and cuts accurately with or against the grain. Naturally, Idaho White Pine is a perfect base for paints and enamels, requiring fewer coats and less repainting. It is distinctly a light-colored wood.

And in spite of storm and sun, White Pine retains its shape and dimensions, its beauty and character of finish. Doors open quietly, easily. Baseboards nestle close to the floor and wall. Clapboards stay in place. Perhaps the finest tribute to any wood is the fact that those New England homes, built of White Pine centuries ago, are still in use.

There is an ample supply of Idaho White Pine for almost every building purpose. Use it for siding, exterior finish, window and door frames, pine paneling, wainscots, cabinetwork and interior trim. Your lumber dealer can fill your order promptly. Western Pine Manufacturers Association, Portland, Oregon.

(GENUINE)

Idaho WHITE PINE



This familiar trade-mark has been used for years to protect home owners, lumber dealers, architects and builders.

FOR ADVERTISERS' INDEX SEE NEXT TO LAST PAGE

buying is always granted legitimate discounts in any industry, the practice has not always worked out to advantage in the building industry. Builders have sometimes accused manufacturers of pegging their prices too high, and manufacturers are bitter in their condemnation of builders who force prices down so that there is no profit in the job for the makers of the products. Some adjustment may eventually have to be effected in the distribution system. Meanwhile, the individual builder is not always in a position to get price reductions because of the small scope of his operations. In most cases where relations are excellent between builder and dealer, the dealer is anxious to retain the builder as his customer and the builder can assure himself that he is getting the lowest local price obtainable.

There are many ways in which a builder may reduce the costs of the material necessary to make the finished home. Like the builder who picked up the odd lots of tile, it is often possible to make a good buy in old brick, or other material. One successful builder in New York State has tied up with a man in the back country who furnishes him with evergreens, shrubs, and trees as well as rustic furniture, at a low price. Thus he is able to cut down materially on his landscaping costs.

The story is told of one builder on the coast who saw an old boat being dismantled and immediately seized upon the idea of using a lot of the lumber and equipment in a shore house designed for a summer prospect from the city. He secured the stuff from the boat at a song and cleverly built it into a shore residence that reflected the atmosphere of the old seaport. He found a prospect immediately after the house was finished at a price that reflected the thought and effort that had gone into the replacement of the ship's appointments, and it soon became a show place.

Job Planning Cuts Costs

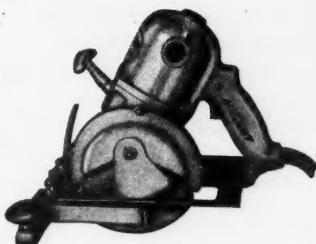
(4) *Analyzing building operations.* Fifteen years ago, one of the first builders to win fame for fast erection of houses in an Eastern industrial city, and who later became one of the best known speculative builders of his section, gained the reputation of being such a careful planner that it was said of him that he fell asleep over his blue prints late at night, poring over the plans in order to cut operating costs to the minimum. He so organized his gangs that no builder within a radius of twenty-five miles could beat him for speed. There were many who criticized the quality of his work but none who questioned his efficiency of operation.

Quality and efficiency need not be enemies. It is possible to turn out a good job in fast time with little waste, but it takes planning. Even on the small job, it pays to keep the plumber out of the carpenter's way and vice versa. In the building industry, more than any other, time is money and construction efficiency keeps carrying charges down. Almost any operation can be improved with study. Cutting and framing, dove-tailing of subcontract operations, sheathing, flooring, shingling, inside trim and even deliveries can be analyzed and shorn of unnecessary and costly delays.

(5) *Devising an economic design.* Here is where the smart builder can achieve great results if he is so minded. There is a successful suburban builder in a town in New Jersey who has worked out an easily framed design that is practically a story-and-a-half affair although it looks like two stories. Prospects have gotten in each other's way to buy these houses because

(Continued to page 96)

New... Compact...
100% Safe.
**The Carter Electric
Safety Saw**
No. W306



TEDIOUS hand sawing and dangerous power saws go out when one of these new Carter Safety Saws is put on the job.

The Carter No. W306 Saw is light in weight—only 14 pounds. It is compact and can

be used in close quarters. With plenty of power and heavy duty ball bearings throughout, this tool just eats its way through the toughest lumber. The saw blade is positively protected to prevent injury to the operator.

For making cuts up to $1\frac{7}{8}$ " the Carter No. W306 Electric Safety Saw can not be equalled.

**Do your finishing
with a Carter
Electric
Disc
Sander**



No more "elbow grease", no more uneven surfaces if you let this new Carter Sander do your finishing work.

It is compact—gets right up into the corners. Runs on leak-proof, dirt excluding bearings. Full load speed 1800 R.P.M. Weighs only $15\frac{1}{2}$ pounds. Position of handles makes it exceptionally easy to operate. Diameter of disc—9 inches.

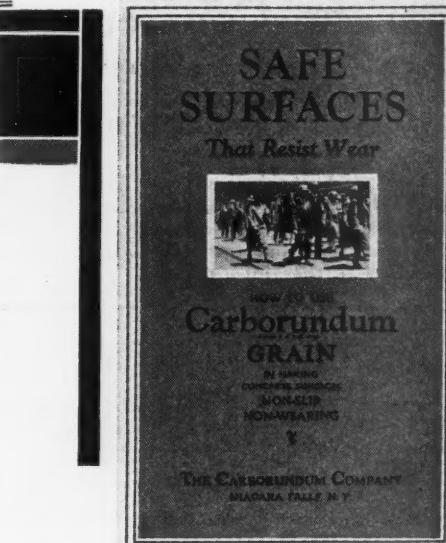
Complete description of these two new Carter Tools will be sent upon request. Ask for folder S-1

THE R. L. CARTER COMPANY
116 Elm Street :: New Britain, Conn.

CARBORUNDUM

REG. U. S. PAT. OFF.

OFFERS A PRODUCT
AND A SERVICE
TO GENERAL CONTRACTORS
AND BUILDERS



SAFEGUARD the footsteps of millions. Recommend CARBORUNDUM BRAND SILICON CARBIDE GRAIN to owners and architects for making safe all sidewalks, floors, ramps—any concrete surfaces subject to foot traffic—gives sure footing—a non-slip surface—that will resist years of wear.

Send for this leaflet. It gives you complete practical information on how to apply the grain.

**THE
CARBORUNDUM
COMPANY
NIAGARA FALLS, N. Y.**

CANADIAN CARBORUNDUM CO., LTD.
Niagara Falls and Toronto, Ont.

[CARBORUNDUM IS A REGISTERED TRADE
MARK OF THE CARBORUNDUM COMPANY]

THE CARBORUNDUM CO., NIAGARA FALLS, N. Y.

Send me the Two Leaflets:

"How to Use Carborundum Grain"

"Carborundum Brand Products for General Contractors"

Name.....

Address.....

"ANTI-HYDRO"

for
Permanent Concrete
•
Hardens and Waterproofs
•

It quickens the hardening of concrete, thereby reducing construction costs—a valuable feature when time is at a premium. Use this coupon for further information!

ANTI-HYDRO WATERPROOFING CO.
295 Badger Avenue, Newark, N. J.

Please tell me more about "Anti-Hydro", the integral waterproofer and hardener. Also give me details regarding your 25-year guarantee.

Name.....
Address.....
.....

Improved JAEGER DUAL-MIX Tilter!



THE world's biggest mixer manufacturer says this is the fastest, easiest handled Timken bearing 7S mixer ever built. Improved Dual-Mix action, faster discharge. Let us tell you about it. Send for new catalog and low prices.

THE JAEGER MACHINE CO.
521 Dublin Ave., Columbus, Ohio

they look to be worth much more than the actual selling price which is in a nice price range, \$7,000.

His secret is a frame that is easy to erect, a well worked out interior that pleases housewives, an exterior that impresses prospects with a brick facing and with an upper story of stained clapboarding that actually is cheaper than ordinary clapboarding.

Many builders have found it profitable to consult architects in order to secure just the right design. They have found that poor design may be costly in the long run. Other builders have the knack of working out plans themselves and have produced bungalow, story-and-a-half and even two-story designs that look well and which are extremely economical to erect. The false gable is often used in the story-and-a-half class and there is a growing tendency to add to the appearance of a low and moderate cost house by brick or stone facing in front. This works out particularly well with some of the Colonial styles. Rough paneling of low cost is sometimes very appropriate in the modern studio living room. In Spanish and English designs it may be possible to cut down on the use of inside trim. Dozens of ways to save money will occur to the alert builder who studies designs and makes them conform to an economic viewpoint without injuring their appearance.

Close study of design, before ever the house is built, both exterior and interior will probably result in more economy than any other piece of analysis.

(6) *Row housing or special construction.* Row housing, with its one excavation and party walls between, has long been noted for its economy of construction. It is one way to get cheap housing. Another way is to work out some special type of construction. One of the most recent examples of this is the new steel frame house illustrated in connection with this article. An advanced type of steel framework has been worked out and the cost of erection is said to be lower than the older type of steel frame. The first two houses of this class, one a bungalow and the other a story-and-a-half type, will soon undergo a test erection on Long Island.

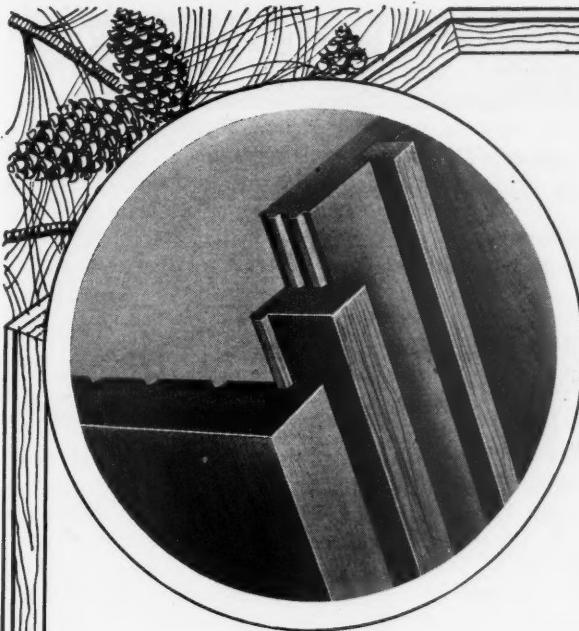
Within the next five or ten years, we may expect to see increasing numbers of these special type houses in which new methods of construction are employed.

Lower Costs with Improved Tools

(7) *Using modern machinery, tools and equipment.* A shop to cut standard lengths of studding, joists, etc.; power saws on the job; floor surfacers and sanders, conveyors, mixers—all kinds of modern equipment have been proven by actual cost studies, certified by survey experts, to reduce construction costs. Not only in apartment building, where great savings may be effected by power equipment, but in smaller residential work, modern power tools and machinery are effectively aiding the up-to-date contractor to cut costs. Every builder should make a special study of the application of power equipment to his work to achieve the utmost in time and money saving efficiency.

(8) *Using substitute materials.* Recently there was placed on the market a wood unit, so manufactured as to be light in weight, and large enough so as to save much time in installation. It is only one of many new products that have appeared in the past few years, all designed to give an equal, if not a better service, at lower price. Not all of these materials are cheaper than those already on the market. Some of them must be utilized in connection with newer types of construc-

(Continued to page 98)



A double wedge-joint between pulley stile and blind stop, and a single wedge-joint between blind stop and casting, makes PINE CRAFT frames draft-proof, dust-proof, weather-proof.

PINE CRAFT frames are available in Idaho White Pine and Ponderosa Pine.

*This Photo Shows You
How Wedge Joints Weatherproof*

PINE CRAFT FRAMES

As this photo shows, PINE CRAFT wedge-joints fit so tightly that they virtually knit the frame parts into a single weather-resistant unit.

The builder who prides himself on building comfort, beauty and lasting satisfaction into his homes, will find PINE CRAFT frames a friendly, economical ally.



*The World's Largest Producers of
Pine Sash and Frames.*

**A Triple Stream of Profit
for You in Your City**

**CONTROL THE BRICK BUSINESS WITH
THIS MACHINE**

Line-Production has revolutionized brick manufacture. Simply dump concrete in hopper of this Automatic Dunbrik Machine, and out come three rows of perfect brick at the other end in a continuous line—as if by magic. Simple. Perfected.

NEVER BEFORE SUCH LOW COST

Think of making brick for less than \$7.00 per thousand. Amazing, yet true. A production cost never before approached by any other method or process. You have a capacity of 24,000 per day—units that are absolutely accurate—stronger—more easily laid—produce a stronger keyed bond in the wall, and yet—1/5 lighter and effecting a 20 per cent saving in material.

WHAT DUNBRIK MANUFACTURING OFFERS

You can dominate the brick business because of your superior product and your low cost of production with this Automatic Line Production Machine. Your business and investment is protected by exclusive franchise for your territory. Send for book and learn how easily you can establish a Dunbrik Plant of your own on our special pay-as-you-produce plan.

OTHERS POINT THE WAY TO YOUR SUCCESS

This revolutionary process and the DUNBRIK Machine have amazed the building trade. The wide acceptance of Dunbrik in such cities as Grand Rapids, Kalamazoo, Flint, in Canada, and in both Eastern and Western centers for all types of construction is proof of its superior qualities, and the progress made by its manufacturers is your guarantee. Get the complete story as told in the DUNBRIK MANUFACTURING DIGEST. Send for a copy of this book today. No obligation.

**Capacity
24,000
Brick
Per Day**

50 BRICK A MINUTE

20% LIGHTER WEIGHT

**Cost per 1000
from Operating Plant
Cement 193
Sand 2.89
Labor .90
Overhead 1.00
Total 6.78**

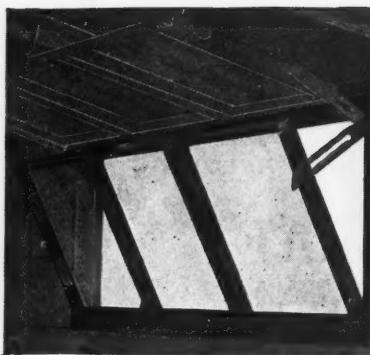


Your Steel Warehouse!

Yes, this is a picture of your warehouse—here thousands of tons of steel are stocked, ready for immediate fabrication and prompt shipment to you. Send us your inquiry. Our low prices will surprise you.

**INTERNATIONAL
PRODUCTS**
Store Fronts
Marquise
Steel Windows
Window Guards
Skylights
Roof Ventilators
Steel Stairs
Stair Railings
Fire Escapes
Fire Doors
Lift Doors
Garages
Airplane Hangars
Aircraft Plants
Warehouses
Steel Beams
Bowstring Trusses
Metal Ceilings
Freight Elevators
Highway Bridges

**INTERNATIONAL
STEEL AND IRON COMPANY**
1330 Edgar Street
Evansville, Indiana



**The
NEW VENTO
PREMIER**

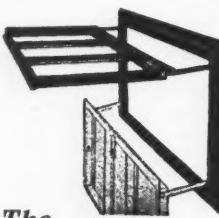
Requires no puttying. Glass can be set in less than one minute per pane. Double contact all around—absolutely weather-tight. Overhead ventilation or full opening upward in three seconds. New locking bar permits locking or unlocking at sill level.

**THERE'S RARELY A BUILDER
THAT DOESN'T PREFER
THE NEW VENTO BASEMENT WINDOWS !**

By actual experience, it's a rare occasion when a builder picks any other basement window in preference to either the new VENTO PREMIER or the VENTO CHALLENGER—providing, of course, that he has had the opportunity of actually inspecting the latter.

The PREMIER is the super window—moderately priced. The CHALLENGER combines real quality with many features of convenience equalled only by the PREMIER, at the lowest price installed of any window on the market. This is a bet too good to miss. Take a few minutes to inspect these windows at a nearby building supply or lumber dealer or send for catalog and descriptive literature.

See them today at your building supply or lumber dealer, or write for complete catalog.

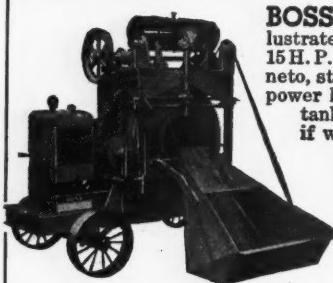


**The
CHALLENGER**

Provides overhead ventilation—full opening upward or downward. CONVENIENTLY. Requires no puttying. Strong, sturdy, rigid. Weather-tight, double contact construction.

VENTO STEEL SASH CO.
Puttyless Windows for Basements, Garages, Factories, Barns, etc. MUSKEGON MICHIGAN

LOWER PRICES
Compare Prices and Quality with All Others



BOSS 14S—Non-Tilter—Exactly as illustrated—on four steel wheels, 4-cylinder 15 H. P. radiator cooled LeRoi engine, magneto, steel engine housing, automatic stop power loader, measuring pressure water tank, stub hitch or team pole. \$39.50 less if wanted on skids instead of wheels.

**\$1497 NET CASH
F.O.B. KEOKUK**

BOSS 14S as Illustrated
Hyatt Bearing Equipped
A.G.C. Approved

Price through dealer	\$1970.00
Direct from factory price	1497.00
Your Saving	\$ 473.00

Look at These Direct From Factory Prices

BOSS-28S	\$2090.00	Batch Hopper, Tank, 35 H. P. Engine
BOSS 10S	794.00	Power Loader, Tank, 4 Cyl. Engine
BOSS 7S	650.50	Power Loader, Tank, 2 Cyl. Engine
BOSS 5S	452.00	Power Loader, Tank, 2 Cyl. Engine
BOSS 3½S Tilter	\$152.00	BOSS 3½S Non-Tilter .. \$204.50

Direct From Factory Prices on All BOSS Equipment

Write, Wire or Phone Today for Complete Information

BOSS
MIXERS
PAVERS
HOISTS
DUMP BODIES

Manufactured by

THE AMERICAN CEMENT MACHINE COMPANY
302 BANK STREET, KEOKUK, IOWA, FOR SIXTEEN YEARS
AB-8-Gray

tion, without which the saving in cost may be negligible or entirely absent.

Many builders who have studied carefully the characteristics and costs of new materials and products, have been able to produce unusually striking and attractive effects at lower costs through the use of these products, which not only embrace materials that are part of the structural frame, but also products for walls, floors, etc.

Any builder, with a little study, may discover a use for a new product in his houses which the manufacturer himself has not thought of.

(9) *Utilizing different kinds, sizes and grades of material.* Every builder knows that the unscrupulous operator may "skin" a job by employing cheaper grades of lumber. On the other hand, there are plenty of legitimate opportunities for the builder to cut residential costs by pointing out to the owner where money can be saved in certain parts of the house by judicious choice of cheaper materials.

A builder of Dutch Colonial cottages in the East has achieved effects of unusual attractiveness by facing his houses with rejected brick that no one else would buy.

When painted trim came in, examples were plentiful of the cutting of finishing costs. Studio and panelled living rooms gave opportunity to utilize cheaper grades of lumber in striking ways. One builder of houses costing \$4,000 put in a low grade of oak flooring that looked fairly good when it was finally down. Where owners are willing to pay the price of products and materials that are of the highest grade then the builder can put them in without further thought; but, in low cost housing, there must, of necessity, be an attempt to lower costs by utilizing available grades of material in lower price ranges.

Often, savings can be effected by utilizing different sizes of lumber, particularly in shorter lengths which can be bought more cheaply if the plan can be made so they can be used.

(10) *Reducing the quantity of material.* Reducing the quantity of material in a house borders on the illegitimate. In most cases, the quantity cannot be reduced without seriously impairing structural strength. And yet there may be cases where tradition has called for an excessive amount of material where it may not actually be necessary.

Cheaper Financing Possible

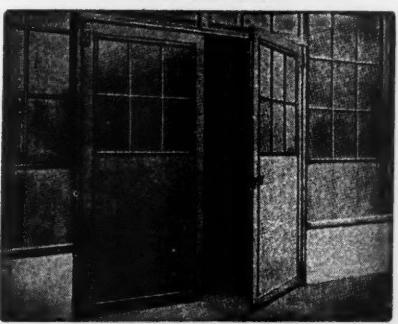
(11) *Securing cheaper financing.* Where? will be the immediate question of most builders. If and when, the new central mortgage bank system, described in our July issue, goes through, then builders throughout the country should be in a position to receive cheaper financing. Meanwhile, it is surprising how many builders get themselves into serious credit difficulties when relations with reputable loaning institutions might have kept them out. Learning to reduce his carrying charges may be the hardest job any builder ever undertook because his mind may be on production rather than on the business side of his affairs; and yet no builder ever became very successful without mastering the business angles. Securing money for longer terms so as to avoid renewals, getting the lowest rate available, dovetailing subcontract and material payments with bank payments, trying to sell the house before completion and getting a possible down payment—all of these and other methods must be tried to cut financing costs, which make one of the greatest burdens of the industry.

(Continued to page 100)

QUALITY Joins Hands With ECONOMY



TRUSCON STEEL CASEMENTS
add charm and distinction to
the modern home



TRUSCON STEEL DOORS
for industrial buildings, service
entrances, garages, etc.

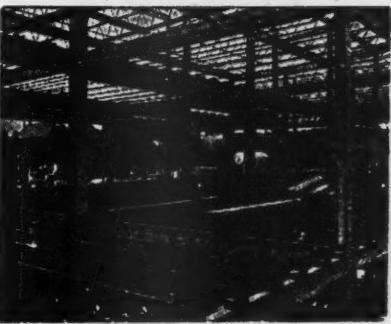
Truscon offers you tried and tested Steel Building Products. Their high quality insures enduring satisfaction. Distinctive Truscon features save time and labor in installation. Their moderate cost makes them practical and desirable for all buildings. Truscon furnishes all types of steel products for modern, permanent construction. You can do a better job at greater profit to yourself by using Truscon Steel Building Products. Write for catalogs and prices.

TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO

Warehouses and Offices in Principal Cities



TRUSCON STEELDECK ROOFS
fireproof, light in weight, insulated
to any degree, economical



TRUSCON STEEL JOISTS
for permanent floor construction,
quickly erected at low cost

STEEL BUILDING PRODUCTS

"DAHLQUIST"

NOW /

Clean fresh hot water
for DRINKING—COOKING

The TURBO-AQUATHERM

A Dahlquist automatic storage system equipped with this device offers the buyer something entirely new. A water heater that quickly supplies hot water which is always as fresh and clean as that in the cold water lines and which may be safely used for drinking and cooking as well as for every other household purpose.

Accumulation of sediment or stale water in the boiler is automatically prevented and the danger of burnouts as with other systems completely eliminated. The thermal efficiency is greatly increased and the expense for fuel as a result is lessened. Write for complete details.



DAHLQUIST MFG. COMPANY
10 West 3rd Street,

So. Boston, Mass.



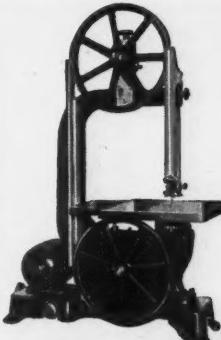
H & A 14" BAND SAW

*Cuts Your Costs by
Speeding up Work*

You can make every job pay you an extra profit. Simply speed up production with H & A portable electric equipment.

New H & A Band Saw turns out by power beautiful work right on the job—in minimum time at minimum cost. Handles heaviest jobs with amazing ease.

Large capacity. More rigidity. More refinements and improvements than any other band saw. Refinements which you might expect to pay handsomely for. Yet H & A equipment is priced surprisingly low. Write today for FREE catalog giving complete line of H & A portable electric equipment. Send today. Your copy's FREE.



Send for FREE Catalog of H & A complete line of woodworking equipment, including Band Saws, Rip Saws, Jointers, Lathes, etc.

Heston & Anderson
208 Stone St., Fairfield, Iowa



Don't Guess at the Line...

Follow it

by using a WAPPAT 2A Electric Handsaw.

It has a non-shatter glass sawdust shield that gives full sawing vision. And of course, it has the patented automatic safety guard.

Other WAPPAT Products

- Portable Electric Drills
- Portable Electric Grinders
- Portable Electric Lock Mortisers
- Portable Electric Planes

WAPPAT
INCORPORATED

7526 Meade Street,
Pittsburgh, Pa.

Division Simonds Saw and Steel Co.

Send us Catalog S-7

Name.

Address.

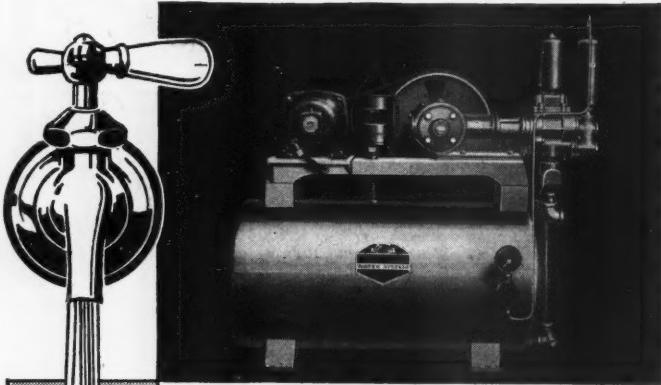
City.



"glaze all
windows and doors
using double strength
Adamston Flat glass—
it's A Brand You
Can Depend Upon"

ADAMSTON FLAT GLASS COMPANY — Clarksburg, West Virginia
Branch Sales Offices: 1 Madison Ave., NEW YORK CITY — 11 So. La Salle St., CHICAGO, ILL.

THE SILVER PRINCE WATER SYSTEM

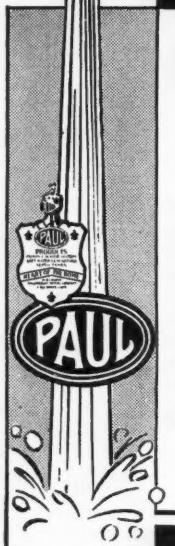


RUNNING WATER at Low Cost!

THE Paul Silver Prince Water System illustrated above is a real outfit—300 to 400 gallons capacity per hour at an amazingly low price. This is the job you can sell in competition on a convenient time payment plan. A single unit, complete and compact, automatic air volume control, self oiling, self priming and fully automatic. Get your demonstrator on the floor now and go after business. Write for bulletin today.

FORT WAYNE ENGINEERING and
MANUFACTURING CO.

1713 N. Harrison St., Fort Wayne, Ind.



(12) *Buying land cheap.* This has been put last although it may well have come first because many a successful residential builder, dealing both with owners and on speculation, has obtained his start by securing cheap, but well-located land. It is surprising how many house buyers overlook the fact that they are buying many other things besides the house itself—land, location, landscaping, trees, etc. Obviously, the lower the cost of these other things, the lower the price that can be put on the house.

One of the most successful residential builders in New York State today is a former architect who is erecting well designed homes in the small estate class. One reason for the unusual price on his houses is the fact that the land on which they are being erected was originally bought at low, acreage prices.

He is able to give quite a lot of land with each home, put a very reasonable price on the house and lot, and still make a profit.

Shrewd land purchase is one of the fundamental essentials for success in residential building.

How to Make Accurate Preliminary Estimates

(Continued from page 50)

most important consideration.

One of the fine features of the cost recording system as suggested by these forms is that it is so simple to put into operation, and so easy to keep track of. All the equipment that is needed is an ordinary 8½ by 11 inch loose-leaf notebook and a good supply of ruled sheets punched to fit it. The three recommended forms may be drawn up by hand or may be inexpensively printed or multigraphed. They may all be kept in the one notebook, which should be of good sturdy construction for it will see a lot of service.

Various forms of this system are in use by many contractors and builders; it may be changed as needed, for it is better to fit the *system* to the *job* than to try to fit the *job* to the *system*. As suggested at the beginning of this article, there is no satisfactory substitute for a complete final estimate made by proper pricing of detailed quantities. But to meet demands for quick preliminary cost estimates, the use of a system such as has been described will prove of very great value. Even so, the "wise ones" will refrain, wherever possible, from making too definite commitments in advance. Let your experience tables help you all they can, but do not go out of the way to make predictions that, even in the best of businesses, may not turn out to be 100 per cent exact.

Machine Filing Saves Money

(Continued from page 67)

"The economy of machine filing is in direct cost of filing and in labor. With about 6,570 saws to be conditioned in a full year's operation, the direct saving in filing cost would be \$880.38. This is over four times the cost of the machine. Labor saving at the lower figure of $\frac{1}{3}$ hour per carpenter per day for a full estimated schedule of 12,045 hours would be \$4,015.00.

"The total of these two items of gross saving must be reduced by the estimated pro-rate of truck expense for pick-up and delivery of saws. This leaves a net annual saving of \$4,795.38 which is practically 24 times the cost of the machine.

"With indicated savings of this amount, it is evident that Sharp Construction Company is well satisfied. Likewise the carpenters, finding that their saws cut better and quicker, without jamming and without tearing the wood, are satisfied with the new method."

No Guessing at Building Costs When You Own This Book

We have been extremely fortunate in obtaining a limited number of copies of one of the very best Estimating Books published at a price never before thought possible for such a complete work. We want our readers to share in our good fortune.

Every builder, every lumberman, every sub-contractor needs an accurate, up-to-date method of figuring material and labor costs before he can intelligently bid on a job. With this book as a guide no one will bid so low as to sustain a loss, nor so high as to lose a contract.

Nearly 1,000 Pages of Information

This book contains 956 pages, 6 x 9 inches, and weighs $3\frac{3}{4}$ pounds. It is completely cross-indexed and covers every material, operation and labor cost that goes into home building. It originally sold for \$15.00. The author has a nation-wide reputation as an authority on cost systems. The book is printed on high-grade book paper and attractively and durably bound.

Offer Limited to Our Readers

As our supply of these Estimating books is limited we are obliged to confine this offer to readers of AMERICAN BUILDER AND BUILDING AGE in combination with a new or renewal subscription. The books will not be for sale separately. We will give our readers the benefit of the amazingly low price at which we obtained these books and urge the necessity of getting your order in at once.

Special Low Combination Prices

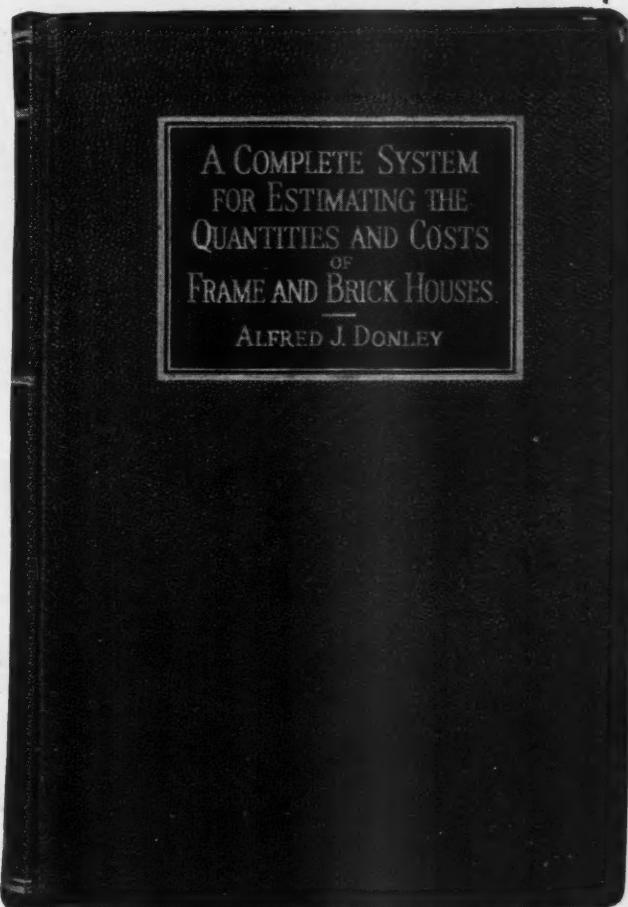
We do not want to make a profit on our fortunate "buy". We do want to give the utmost service to our readers. We know how urgent a need there is for a real first-class Estimating book and with this in mind, we offer this fine book in combination with a new or renewal subscription to the AMERICAN BUILDER AND BUILDING AGE at the following remarkably low prices:

AMERICAN BUILDER AND BUILDING AGE for One Year and the Estimating Book, postpaid.... \$4.00

AMERICAN BUILDER AND BUILDING AGE for Two Years and the Estimating Book, postpaid.... \$5.00

AMERICAN BUILDER AND BUILDING AGE for Three Years and the Estimating Book, postpaid.... \$6.00

This offer good only in the United States and Canada.



Actual Size of Book; 6" wide; 9" high, $1\frac{1}{2}$ " thick
956 Pages, weight $3\frac{3}{4}$ pounds

The American Builder and Building Age, Date.....
105 W. Adams St., Chicago, Ill. Aug. 1931

Gentlemen: Find \$..... to pay for.....year's subscription to the big New AMERICAN BUILDER AND BUILDING AGE—with which I am to receive, postpaid, a copy of your book, "A Complete System of Estimating."

Name

St. and No.

Post Office State.....

IMPORTANT: Building publications are required to show occupations of subscribers. Please help us to properly classify you by stating the line of business in which you are most active on line below.

Occupation

New or existing buildings are prospects for Wright Rubber Tile floors. Our Installation Instruction Booklet has been instrumental in starting many men in a profitable business. Write for a copy today.

Wright Rubber Products Co.
Racine, Wisconsin

P. O. Box A-696

WRIGHT RUBBER TILE
Rubber Only Material That Withstands Tire Road Wear

ALLMETAL WEATHERSTRIP

COMPARE THE QUALITY!
COMPARE THE PRICES!
THEN JUDGE THE VALUE!

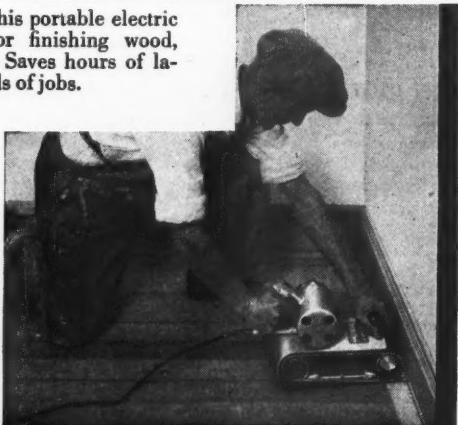
Your decision should be ALLMETAL.
We will welcome your inquiries

ALLMETAL WEATHERSTRIP CO.
231 West Illinois Street Chicago, Ill.

You can use this portable electric belt sander for finishing wood, metal or stone. Saves hours of labor on hundreds of jobs.

Noser attachment permits sanding right up to vertical obstruction. Powerful motor. Weighs only 18 lbs. Belts 4 $\frac{1}{2}$ ". Write for details.

SKILSAW, Inc.
Dept. 11
3308 Elston Ave.
Chicago, Ill.



SKILSAW SANDER

Build and Pay Like Rent

(Continued from page 38)

Loans will be considered for 5 years, 6 years, 7 years, 8 years, etc.

"A written application is required to be made on blanks furnished by the company. Our representative, whose name appears on this circular, will supply necessary forms and aid you in arranging your mortgage."

A letter from the main office of the company in Newark, New Jersey, advised me as follows:

"We lend considerable money on dwellings in the principal cities of the United States at a prevailing rate of interest with suitable amortization. We cannot, however supply you with a full outline of our loaning policy because our rates of interest vary in various localities, and the per cent of loan to value which we are willing to make is a variable quantity, depending upon loan conditions."

Similar loan plans are available through the New York Life Insurance Company and the Metropolitan Life Insurance Company. Building and loan associations, holders of \$8,000,000,000 for some twelve millions of individual members, have on hand adequate funds for financing construction of one-family residences in nearly all parts of the country.

Usually a building and loan association is able to loan about 60 per cent of the total cost. The owner usually pays back ten dollars for every thousand borrowed each month. Out of this is taken the interest, which varies in various localities, and is 6 per cent in most states, including New York. The balance of such monthly payments is of course then applied to the reduction of the principal, and the interest the following month is figured on the reduced balance. By this system, the mortgage is usually wiped out in exactly eleven years and seven months.

Associated Leaders' Plan

Ames, Emerich & Co., investment bankers, in conjunction with Arthur A. Hood, of the Associated Leaders of Lumber and Fuel Dealers of America, have organized the National Homes Finance Corporation, a two and a half million dollar home financing service, for its dealer subscribers. These operate in 44 states and include several hundred important markets. Announcement was made on July 20 of the personnel of the board of directors. It is understood that the financing of homes is to start at once. (See pages 64 and 65, Jan., 1931, issue of this publication for complete description of this financing plan.)

Fort Wayne Plan

I am most intimately acquainted with the plan of the Fort Wayne Builders' Supply Company, which finances home building and modernizing through its newly created subsidiary, the Builders' Investment Company.

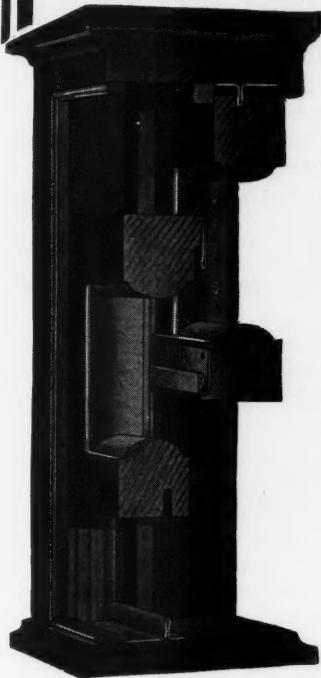
By this plan, the company is able to loan 75 per cent of the total cost, perhaps higher, depending on the appraisal. This is equal to the best offered by the mail-order local store organizations. Fifty per cent of this is loaned on the first mortgage, and the balance on the second.

Suppose, for instance, the lot was \$1,200 and the house \$5,400, making a total of \$6,600. In this case, \$3,300 would be loaned on the first, \$1,650 on the second. The prospect must plan to live in the house. The lot must be within the city in a section with all improvements, and he must have on hand a lot fully paid for or its equivalent in cash.

(Continued to page 104)

USE THE BEST ACCURATE METAL WEATHERSTRIPS

Guarantee Satisfaction



There are no dull times in the weatherstrip business. You can start to work at once. Sell, install, collect. The profits are all yours. We will help you get a start.

Accurate Metal Weatherstrips are of the highest grade material and there's an accurate strip for every opening.

Free samples and complete information will be mailed you at once. Write us today.

ACCURATE METAL WEATHERSTRIP CO.

208 East 26th Street
NEW YORK CITY

All the Products

Advertised in these pages
can be recommended to

American Builder and Building Age Readers

Dealings with these advertisers will prove to be highly profitable to you.

Be progressive and investigate what these important houses have to offer you.

If you are interested in any product that is not mentioned here please write us. We will gladly put you in touch with the manufacturers best fitted to supply your needs.

American Builder and

Building Age

105 W. Adams St. CHICAGO
30 Church St., NEW YORK CITY

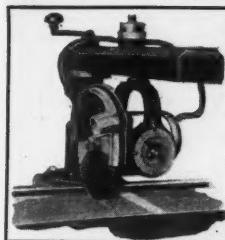
YOU can't afford to be without

THE
20th CENTURY
WOODWORKER



ONE machine that does the work of five machines...at the cost of one! Cross-cut saw, rip saw, jointer, shaper, router...saving time, space, power and money! Smooth and swift in operation...easily run by any one...always accurate and dependable. This machine will stop waste and make money in every shop where it is used. If YOU want your shop to be one of them, write today for booklet and prices. Ask, too, for booklets about other wood-working and saw mill machinery.

AMERICAN
SAW MILL MACHINERY CO.
61 Main Street • Hackettstown, N. J.



for Range!

29 distinct cutting operations in lumber, tile, brick and metal.

DEVAL
WOODWORKING MACHINES

Products Corp.

207 Fountain Ave., Lancaster, Pa.

WHITE HEXAGON FLOOR TILE **18¢** PER SQ.FOOT

Positively lowest price on Standard quality white hexagon Ceramic Floor Tile. We take a very small profit to do a volume business. Satisfaction or money back. Mounted on sheets of paper 12x24 inches—simplifies the laying process. We can furnish all other styles and colors of floor tile.

WRITE for BIG TILE CATALOG



Write for Big Tile Catalog showing complete line in colors. We sell direct to Builders, Tile Setters, Bricklayers, Contractors, Home Builders at Wholesale Prices.

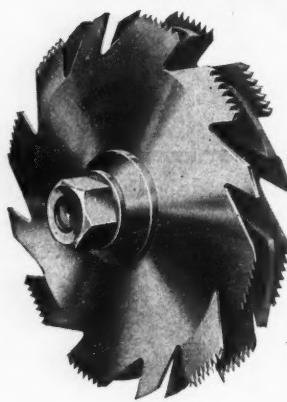
Lloyd Floor & Wall Tile Company
Box 3064 Kansas City, Mo.

WALL TILE **25¢** PER SQ.FOOT

white Glazed

No other material can compete at this price for Bathrooms, Kitchens, Hospitals, etc. Choice of 6"x3" or 4 1/4"x4 1/4". Order direct from this ad. Satisfaction or money back.

You need a
HUTHER
Dado head



Developed from our own patents, this adjustable groover cuts either with or across the grain. Cutters may be used singly, in pairs or in any combination necessary for desired cut.

Send for one on approval. It may be returned at our expense if unsatisfactory.

Huther Bros. Saw Mfg. Co.
Rochester, N. Y.

Makers of Better Saws for More than Fifty Years

FOUR -IN- ONE

Be Equipped
To Get More Business!

It's no use to try to get business you can't handle. With this modern Parks woodworker you can take care of any job.

Send for complete catalog
THE PARKS WOODWORKING MACHINE CO.
Dept. AB-8, 1524 Knowlton Street,
Cincinnati, Ohio
Canadian Factory: 338 Notre Dame
East, Montreal.

Circular rip and cross-cut saw, 22" band saw, 12" jointer and boring machine.
\$260

PARKS
WOODWORKING MACHINES

Qualitybilt DISAPPEARING STAIRWAY

You can make many profitable sales installing this quick, sure selling convenience in old or new homes. Guaranteed construction — strong — safe — rigid. Nicely balanced for quick, easy operation. Highest quality materials. Lifetime service. Low cost. Gives full use of attic without taking up valuable room below.

Stored in attic when not in use.

Ask your lumber dealer or write us for complete details.

FARLEY & LOETSCHER MFG. CO.
DUBUQUE
ESTABLISHED 1875

2 MODELS

Payment is made on the loan at 1 per cent per month on the cost of the house, or in this case at \$54 a month. Interest during this period is at 7 per cent. Financing charges are 25 per cent of the second mortgage; Sears, Roebuck financing charges are 10 per cent on the gross. In this case, therefore, the builder would pay the Fort Wayne Builders' Supply Company, \$412.50 for finance as against \$540 to Sears, Roebuck.

At the end of five years, the builder gets his deed, or first mortgage, and has a reduction in his monthly payments because of the lower rate of interest, 6 per cent, and lower principal. In this case, he would then pay \$33 a month, for 11 years and six months. Thus, he also has the advantage of more time to pay as compared with the 15-year loan plan of most of the mail-order local store companies.

The Builders' Investment Company has been taking care of its own first mortgages, mostly through local banks, and has been selling the second mortgages to local finance companies without recourse on 7 per cent interest.

This plan also includes payment on insurance on the house against fire and tornado, and on the owner to cover life, health, and accidents. Payments do not begin until the house is completed and the owner ready to move in. The owner may pay in excess of his original monthly payment fee, in which case the finance fee is reduced proportionately. The prospect may build from a plan book offered by the company, or may select or have drawn up another plan that will better meet his requirements. He may use his own contractor, or one recommended by the Fort Wayne Builders' Supply Company, but this contractor must buy all materials through the Fort Wayne Builders' Supply.

The Fort Wayne plan has been most successful. It has been planned by W. Edward Greer, secretary-treasurer of the company, working with John Suelzer, Jr., the general manager and president. Advertisement of the plan has been handled by the writer of this article, and has been most successful. As a result, although but a few advertisements have been run, each ad brings in about 40 prospects and it is believed that almost every good prospect is now in the company files, and a number of houses have already gone into construction.

Last year, the Fort Wayne lumber dealers advertised as a unit, each subscribing to the cost with prospects divided equally among all subscribing dealers. This campaign has been declared to have been the most successful of its kind ever run in this country, since it not only stopped the mail-order local store invasion, but procured several hundred good prospects for the dealers. Because of the success of this campaign and the need for a continuance of the work it began, the lumber dealers, building supply dealers, architects and contractors, each through their associations, are now planning another campaign in Fort Wayne, the details of which are not yet worked out.

The outline of plans given here are offered in the belief that they will suggest a way for contractors and building material dealers everywhere to work out their own plans, either as co-operating units, or as individual companies. At any rate, action is absolutely necessary. Under the present system, a building material dealer is as out-of-date as an automobile company that tries to sell automobile parts at cash, in competition with companies offering the completed automobile in easy monthly payments—and the contractor who continues without a financing hook-up is playing the off-stage role of the village blacksmith.

Beautiful Brick Effects



deserve
Anchor Brand
Mortar Colors

C. K. Williams & Co.
634 No. 13th St.
EASTON, PA.
88 Kent Ave.
BROOKLYN, N. Y.
and
1500 So. Western Ave.
CHICAGO, ILL.

A FIRM FOUNDATION

That's what your business has when you sell Diamond Metal Weather Strips. Over 500 dealers are firm believers in their profit possibilities. Every home and building owner a prospect. Write today!



The Diamond Metal Weatherstrip Co.
Columbus, Ohio



No investment till order is signed; then make 33 1/3 to 50 per cent profit.

SAWS THAT SAVE

Speedmatic Saws

Types K-8 and K-9

You'll never know what a hand power saw really can do until you've owned a SPEEDMATIC. Put one on your next job—and further reduce your costs. Type K-8 cuts 2 1/4", weighs only 12 lbs., and has finger tip depth and angle adjustments, only \$85.00. Type K-9 is a sturdy tool for heavier work up to 3 1/2". Think of ripping 3" stock at rate of 14 ft. per min. or cross cutting a 2" x 12" in two seconds! Guaranteed to cut that fast! Other features you want to know about so ask for a demonstration or free bulletin—no obligation.

Also manufacturers of Take-About Sanders, Speedmatic Floor Surfers, Beavers and Ever-Ready Woodworkers.

PORTER-CABLE-HUTCHINSON CORPORATION

1721 N. Salina St., Syracuse, N. Y.



Type K-9

KAUBLE of IOWA makes \$2000 In Spare Time



MANUFACTURE COLORCRETE ORNAMENTAL PRODUCTS—Side Line or Spare Time. Fascinating. Easy. No experience necessary.

OVER 30 COLORS AND SHADES
Colorcrete your products—make them pieces of art—the dominating vogue. Sell on sight. Over 40 designs from which to select.

BIG PROFITS. QUICK TURNOVER.
See what Kauble of Iowa is doing. Crockett of Texas shows \$1231 profit as side line. Oswald of Colo. over \$3600, etc., etc. Many designs sell for 10 times cost to make.

FRANCHISE GRANTED FREE
Be first to get into this fast-growing, exclusive industry. BIG INTRODUCTORY DISCOUNT. Write today.

COLORCRETE INDUSTRIES
500 Ottawa Avenue
HOLLAND, MICH.

Free Book in Colors



Classified Advertising

RATES:

Small letters 50c per word.
Capital letters \$1 per word.
Minimum twenty words.

**Business Opportunities
For Sale and Exchange
Help and Situations Wanted**

To Insure Insertion Remittance Must Accompany Order

BUILDERS, CONTRACTORS, ETC.

PUT JAPANESE GRASSCLOTH wall covering in your houses. Always appreciated—always a highclass wall decoration. Write for samples. Special prices to quantity buyers. HARRY GALLAWAY, 48 West 48th St., New York, N. Y.

PATENT ATTORNEYS

PATENTS AND TRADEMARKS. Prompt service. Highest references. Moderate fees. GEORGE P. KIMMEL, Patent Lawyer, 94-H, Westory Building, Washington, D. C.

Contractors' Equipment



WAS \$25.00 NOW \$15.00

We are offering these practical, well-built instruments at a ridiculously low price in order to reduce our stock.

THE SIMPLEX

Farm or Carpenter's level with flexible leveling rod and strong wooden carrying case.

Sent subject to approval on inspection.

CHARLES BRUNING COMPANY, INC.
102 Reade Street, New York, N. Y.

WHEN IN NEED OF A SANDER OR SAW RIG

Write to the

REID-WAY CORPORATION
2939 First Ave., Cedar Rapids, Iowa



LESS
COST
LESS
TROUBLE

Austral
Window
Co., 101 Park
Ave., New York.

Please send me a
sample pair of
AUSTRAL SASH
SUSTAINERS for
which I enclose 50¢ (this
covers only actual cost and
postage).

Name

Address

"TODAY'S HOME BUILDERS WANT PROVISION IN ADVANCE FOR ENOUGH TELEPHONES"



Built-in conduit and eight telephone outlets, including two telephone niches, provide for telephone convenience in this residence at 1857 Roundhill Circle, Blue Ridge Addition, Seattle, Washington. ROY D. ROGERS, Architect, Seattle. CARLSTEDT & CARLSON, Builders, Edmonds, Washington.



PRESENT business conditions place a premium upon *value*. Buyers demand it in homes as in everything else. Successful builders, by including *extra values* in the houses they construct, make sales more easily and keep clients content with their purchases.

One of the easiest and least expensive extra values is the provision for adequate telephone arrangements. The builder of the house illustrated here says:

"Today's home builders want homes that are completely modern. That is why they request that adequate provision be made in advance for *enough* telephones.

"Before work starts on a home, we find that it is best to consult with representatives of the local telephone company. Following their recommendations, we build in a complete telephone conduit and outlet arrangement that will conceal all wires and provide ample pathways for present telephone requirements and future rearrangement or expansion."

Consult your local telephone company when building or remodeling residences. Their advice and assistance is yours without charge. Just call the Business Office.

